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# CORRECTIONS.

## EPHEMERIS FOR 1874.

| | | | |
|---|---|---|---|
| Page 22, Feb. 28, | Mean time of sidereal 0$^{h}$, | *for* 3$^{s}$.36 | *read* 13$^{s}$.36. |
| 39, Mar. 28, | Sid. time of Mean Noon, | " 56$^{s}$.78 | " 55$^{s}$.78. |
| 285, $\beta$ Tauri, | Declination, | " 29′ | " 30′. |
| 344, Dec. 36, | $\triangle$, | " 50′.0 | " 49′.0. |
| 410, line 9, | Moon's declination, | " 14′ | " 13′. |

## EPHEMERIS FOR 1875.

| | | | |
|---|---|---|---|
| Page 283, $\beta$ Tauri, | Declination, | *for* 29′ | *read* 30′. |
| 354, Oct. 7, | Right Ascension at Mean Noon, | " 27$^{s}$.57 | " 27$^{s}$.51. |
| 28, | " " " " | " 22$^{s}$.25 | " 22$^{s}$.28. |
| 484, Moscow, | Latitude, | " 18″.9 | " 19″.8. |
| 493, 2d line from bottom, | | " 497 | " 493. |
| 494, line 12, | | " 490–492 | " 486–489. |
| " 26, | | " 494 | " 490. |
| " 28, | | " 493 | " 489. |
| 495, " 9, | | " 0$^{h}$.48 | " 0$^{d}$.48. |
| 496, " 33, | | " appropriate | " approximate. |

**Note.**—1875, June 29, 13$^{h}$, 3 Sagittarii may be occulted by Mars.
1876, Feb. 27, 14$^{h}$, $\beta^{1}$ Scorpii may be occulted by Jupiter.

THE

# AMERICAN EPHEMERIS

AND

# NAUTICAL ALMANAC

FOR THE YEAR

# 1876.

PUBLISHED BY AUTHORITY OF THE SECRETARY OF THE NAVY.

BUREAU OF NAVIGATION,
WASHINGTON.
1873.

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1873. Sept. 22
Gift of
Prof. J. H. C. Coffin,
Superintendent.

# PREFACE.

THE preparation of the *American Ephemeris and Nautical Almanac* was begun in the latter part of the year 1849, in accordance with an act of Congress, approved on the 3d of March of that year. An account of this preparation and the values of the constants adopted will be found in the Preface and Appendix of the first volume, for the year 1855.

In the volume for 1865 the star ephemeris was greatly enlarged; new places of the stars adopted; the form for moon culminations and moon-culminating stars changed so that less space was required; mean solar time, instead of sidereal time, used in the dates of the ephemeris for the meridian of Washington; BESSEL'S notation in the formulæ for star-reductions substituted for BAILY'S. Several other changes of less importance were also made.

In the volume for 1869 some slight changes were made in the ephemerides of Venus and Mars, and in the arrangement of the stars; and the explanations of the arrangement and use of the tables were revised so as to adapt them to the wants of operators at sea or in the field.

In the subsequent volumes the ephemeris of Neptune is derived from NEWCOMB'S tables; the ephemerides of the outer planets are given for Washington mean noon instead of sidereal $0^h$; and hourly differences for interpolation, instead of the logarithms; new places adopted for the standard stars; some changes made in the pages of occultations; and a revised table given of positions of Observatories.

In this volume the ephemeris of Venus has been prepared from HILL'S tables, published in 1872, and that of Uranus from NEWCOMB'S tables, now in press. The appendix contains an ephemeris of Venus for 1874 and 1875, derived from HILL'S tables.

J. H. C. COFFIN,
*Prof. Math. U. S. Navy, Superintendent.*

WASHINGTON, *June* 1, 1873.

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# CHRONOLOGICAL ERAS AND CYCLES.

## CHRONOLOGICAL ERAS.

THE YEAR 1876, WHICH COMPRISES THE LATTER PART OF THE 100TH AND THE BEGINNING OF THE 101ST YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6589 of the Julian Period;
" 7384–85 of the Byzantine era;
" 5636–37 of the Jewish era;
" 2629 since the foundation of Rome, according to Varro;
" 2623 since the beginning of the era of Nabonassar, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period, corresponding according to the chronologists to the 747th, and according to the astronomers to the 746th year before the birth of Christ.
" 2652 of the Olympiads, or the fourth year of the 663d Olympiad, commencing in July, 1873, if we fix the era of the Olympiads at 775½ years before Christ, or near the beginning of July of the year 3938 of the Julian Period;
" 2188 of the Grecian era, or the era of the Seleucidæ;
" 1592 of the era of Diocletian.

The year 1293 of the Mohammedan era, or the era of the Hegira, begins on the 28th of January, 1876.

The first day of January of the year 1876 is the 2,406,255th day since the commencement of the Julian Period.

## CHRONOLOGICAL CYCLES.

| | | | |
|---|---|---|---|
| Dominical Letters | B,A | Solar Cycle | 9 |
| Epact | 4 | Roman Indiction | 4 |
| Lunar Cycle or Golden Number | 15 | Julian Period | 6589 |

# SYMBOLS AND ABBREVIATIONS.

## SIGNS OF THE PLANETS, &c.

| | | | |
|---|---|---|---|
| ☉ | The Sun. | ♂ | Mars. |
| ☾ | The Moon. | ♃ | Jupiter. |
| ☿ | Mercury. | ♄ | Saturn. |
| ♀ | Venus. | ♅ | Uranus. |
| ⊕ or ♁ | The Earth. | ♆ | Neptune. |

## SIGNS OF THE ZODIAC.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Spring signs. | 1. | ♈ | Aries. | Autumn signs. | 7. | ♎ | Libra. |
| | 2. | ♉ | Taurus. | | 8. | ♏ | Scorpio. |
| | 3. | ♊ | Gemini. | | 9. | ♐ | Sagittarius. |
| Summer signs. | 4. | ♋ | Cancer. | Winter signs. | 10. | ♑ | Capricornus. |
| | 5. | ♌ | Leo. | | 11. | ♒ | Aquarius. |
| | 6. | ♍ | Virgo. | | 12. | ♓ | Pisces. |

## ASPECTS.

☌ Conjunction, or having the same Longitude or Right Ascension.
□ Quadrature, or differing 90° in " " "
☍ Opposition, or differing 180° in " " "

## ABBREVIATIONS.

| | | | |
|---|---|---|---|
| ☊ | Ascending Node. | ° | Degrees. |
| ☋ | Descending Node. | ′ | Minutes of Arc. |
| N. | North. | ″ | Seconds of Arc. |
| S. | South. | $^{\mathrm{h}}$ | Hours. |
| E. | East. | $^{\mathrm{m}}$ | Minutes of Time. |
| W. | West. | $^{\mathrm{s}}$ | Seconds of Time. |

# ASTRONOMICAL EPHEMERIS

FOR THE USE OF

# NAVIGATORS.

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be added to Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | Semi-diameter. | | | |
| | | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Sat. | 1 | 18 45 37.23 | 11.051 | S. 23 2 35.9 | +12.04 | 16 18.40 | 71.10 | 3 38.56 | 1.189 |
| *Sun.* | 2 | 18 50 2.24 | 11.035 | 22 57 33.1 | 13.20 | 16 18.40 | 71.06 | 4 6.95 | 1.175 |
| Mon. | 3 | 18 54 26.89 | 11.018 | 22 52 2.7 | 14.34 | 16 18.40 | 71.01 | 4 34.97 | 1.159 |
| Tues. | 4 | 18 58 51.15 | 11.001 | 22 46 5.0 | 15.48 | 16 18.40 | 70.96 | 5 2.60 | 1.141 |
| Wed. | 5 | 19 3 14.98 | 10.983 | 22 39 40.2 | 16.60 | 16 18.39 | 70.90 | 5 29.80 | 1.123 |
| Thur. | 6 | 19 7 38.35 | 10.964 | 22 32 48.6 | 17.72 | 16 18.37 | 70.84 | 5 56.54 | 1.103 |
| Frid. | 7 | 19 12 1.24 | 10.944 | 22 25 30.3 | 18.82 | 16 18.35 | 70.78 | 6 22.80 | 1.083 |
| Sat. | 8 | 19 16 23.62 | 10.922 | 22 17 45.6 | 19.92 | 16 18.32 | 70.71 | 6 48.56 | 1.061 |
| *Sun.* | 9 | 19 20 45.47 | 10.900 | 22 9 34.7 | 21.00 | 16 18.29 | 70.64 | 7 13.78 | 1.039 |
| Mon. | 10 | 19 25 6.77 | 10.876 | 22 0 57.7 | 22.08 | 16 18.25 | 70.57 | 7 38.44 | 1,016 |
| Tues. | 11 | 19 29 27.49 | 10.852 | 21 51 54.9 | 23.14 | 16 18.20 | 70.49 | 8 2.53 | 0.992 |
| Wed. | 12 | 19 33 47.62 | 10.827 | 21 42 26.7 | 24.20 | 16 18.15 | 70.41 | 8 26.05 | 0.967 |
| Thur. | 13 | 19 38 7.15 | 10.801 | 21 32 33.3 | 25.24 | 16 18.09 | 70.32 | 8 48.96 | 0.942 |
| Frid. | 14 | 19 42 26.06 | 10.774 | 21 22 14.9 | 26.28 | 16 18.02 | 70.23 | 9 11.24 | 0.915 |
| Sat. | 15 | 19 46 44.32 | 10.747 | 21 11 31.8 | 27.30 | 16 17.95 | 70.14 | 9 32.88 | 0.888 |
| *Sun.* | 16 | 19 51 1.92 | 10.719 | 21 0 24.3 | 28.31 | 16 17.88 | 70.05 | 9 53.87 | 0.860 |
| Mon. | 17 | 19 55 18.86 | 10.690 | 20 48 52.8 | 29.30 | 16 17.80 | 69 95 | 10 14.90 | 0.832 |
| Tues. | 18 | 19 59 35.10 | 10.661 | 20 36 57.6 | 30.29 | 16 17.71 | 69.85 | 10 33.82 | 0.803 |
| Wed. | 19 | 20 3 50.63 | 10.632 | 20 24 38.8 | 31.26 | 16 17.62 | 69.75 | 10 52.74 | 0.774 |
| Thur. | 20 | 20 8 5.44 | 10.602 | 20 11 56.8 | 32.22 | 16 17.52 | 69.65 | 11 10.94 | 0.744 |
| Frid. | 21 | 20 12 19.52 | 10.571 | 19 58 52.0 | 33.16 | 16 17.42 | 69.54 | 11 28.42 | 0.713 |
| Sat. | 22 | 20 16 32.85 | 10.540 | 19 45 24.8 | 34.09 | 16 17.31 | 69.43 | 11 45.15 | 0.682 |
| *Sun.* | 23 | 20 20 45.43 | 10.508 | 19 31 35.6 | 35.01 | 16 17.20 | 69.32 | 12 1.12 | 0.650 |
| Mon. | 24 | 20 24 57.23 | 10.475 | 19 17 24.7 | 35.91 | 16 17.09 | 69.21 | 12 16.32 | 0.617 |
| Tues. | 25 | 20 29 8.24 | 10.442 | 19 2 52.2 | 36.79 | 16 16.97 | 69.10 | 12 30.73 | 0.584 |
| Wed. | 26 | 20 33 18.45 | 10.408 | 18 47 58.7 | 37.65 | 16 16.85 | 68.99 | 12 44.35 | 0.551 |
| Thur. | 27 | 20 37 27.84 | 10.374 | 18 32 44.7 | 38.50 | 16 16.73 | 68.88 | 12 57.15 | 0.517 |
| Frid. | 28 | 20 41 36.41 | 10.340 | 18 17 10.6 | 39.33 | 16 16.61 | 68.77 | 13 9.13 | 0.482 |
| Sat. | 29 | 20 45 44.15 | 10.305 | 18 1 16.9 | 40.14 | 16 16.48 | 68.65 | 13 20.29 | 0.447 |
| *Sun.* | 30 | 20 49 51.06 | 10.270 | 17 45 3.9 | 40.92 | 16 16.35 | 68.54 | 13 30.61 | 0.412 |
| Mon. | 31 | 20 53 57.13 | 10.235 | 17 28 31.9 | 41.71 | 16 16.21 | 68.42 | 13 40.10 | 0.377 |
| Tues. | 32 | 20 58 2.36 | 10.200 | S. 17 11 41.6 | +42.47 | 16 16.07 | 68.31 | 13 48.75 | 0.342 |

**Note.**—Mean Time of the Semidiameter passing may be found by subtracting $0^{s}.19$ from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, *to be subtracted from Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | | | |
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Sat. | 1 | 18 45 36.54 | 11.047 | S. 23 2 36.7 | +12.03 | 3 38.49 | 1.189 | 18 41 58.05 |
| *Sun.* | 2 | 18 50 1.48 | 11.031 | 22 57 34.1 | 13.19 | 4 6.87 | 1.175 | 18 45 54.61 |
| Mon. | 3 | 18 54 26.05 | 11.015 | 22 52 3.8 | 14.33 | 4 34.88 | 1.159 | 18 49 51.17 |
| Tues. | 4 | 18 58 50.23 | 10.998 | 22 46 6.3 | 15.47 | 5 2.50 | 1.141 | 18 53 47.73 |
| Wed. | 5 | 19 3 13.98 | 10.980 | 22 39 41.7 | 16.59 | 5 29.69 | 1.123 | 18 57 44.29 |
| Thur. | 6 | 19 7 37.27 | 10.961 | 22 32 50.3 | 17.71 | 5 56.43 | 1.103 | 19 1 40.84 |
| Frid. | 7 | 19 12 0.08 | 10.941 | 22 25 32.3 | 18.81 | 6 22.68 | 1.083 | 19 5 37.40 |
| Sat. | 8 | 19 16 22.39 | 10.919 | 22 17 47.9 | 19.91 | 6 48.43 | 1.061 | 19 9 33.96 |
| *Sun.* | 9 | 19 20 44.16 | 10.897 | 22 9 37.2 | 20.99 | 7 13.64 | 1.039 | 19 13 30.52 |
| Mon. | 10 | 19 25 5.39 | 10.873 | 22 1 0.5 | 22.07 | 7 38.31 | 1.016 | 19 17 27.08 |
| Tues. | 11 | 19 29 26.04 | 10.849 | 21 51 58.0 | 23.13 | 8 2.40 | 0.992 | 19 21 23.64 |
| Wed. | 12 | 19 33 46.11 | 10.824 | 21 42 30.1 | 24.19 | 8 25.92 | 0.967 | 19 25 20.19 |
| Thur. | 13 | 19 38 5.57 | 10.798 | 21 32 37.0 | 25.23 | 8 48.82 | 0.942 | 19 29 16.75 |
| Frid. | 14 | 19 42 24.41 | 10.771 | 21 22 18.9 | 26.27 | 9 11.10 | 0.915 | 19 33 13.31 |
| Sat. | 15 | 19 46 42.61 | 10.744 | 21 11 36.1 | 27.29 | 9 32.74 | 0.888 | 19 37 9.87 |
| *Sun.* | 16 | 19 51 0.15 | 10.716 | 21 0 29.0 | 28.30 | 9 53.72 | 0.860 | 19 41 6.43 |
| Mon. | 17 | 19 55 17.03 | 10.688 | 20 48 57.8 | 29.29 | 10 14.05 | 0.832 | 19 45 2.98 |
| Tues. | 18 | 19 59 33.22 | 10.659 | 20 37 2.9 | 30.28 | 10 33.68 | 0.803 | 19 48 59.54 |
| Wed. | 19 | 20 3 48.70 | 10.630 | 20 24 44.4 | 31.25 | 10 52.60 | 0.774 | 19 52 56.10 |
| Thur. | 20 | 20 8 3.46 | 10.600 | 20 12 2.8 | 32.21 | 11 10.80 | 0.744 | 19 56 52.66 |
| Frid. | 21 | 20 12 17.50 | 10.569 | 19 58 58.3 | 33.15 | 11 28.28 | 0.713 | 20 0 49.22 |
| Sat. | 22 | 20 16 30.79 | 10.538 | 19 45 31.5 | 34.08 | 11 45.02 | 0.682 | 20 4 45.77 |
| *Sun.* | 23 | 20 20 43.33 | 10.506 | 19 31 42.6 | 35.00 | 12 1.00 | 0.650 | 20 8 42.33 |
| Mon. | 24 | 20 24 55.09 | 10.473 | 19 17 32.0 | 35.90 | 12 16.20 | 0.617 | 20 12 38.89 |
| Tues. | 25 | 20 29 6.06 | 10.440 | 19 2 59.8 | 36.78 | 12 30.61 | 0.584 | 20 16 35.45 |
| Wed. | 26 | 20 33 16.23 | 10.407 | 18 48 6.6 | 37.64 | 12 44.23 | 0.551 | 20 20 32.00 |
| Thur. | 27 | 20 37 25.00 | 10.373 | 18 32 52.9 | 38.49 | 12 57.04 | 0.517 | 20 24 28.56 |
| Frid. | 28 | 20 41 34.14 | 10.339 | 18 17 19.2 | 39.32 | 13 9.03 | 0.482 | 20 28 25.11 |
| Sat. | 29 | 20 45 41.86 | 10.304 | 18 1 25.8 | 40.13 | 13 20.19 | 0.447 | 20 32 21.67 |
| *Sun.* | 30 | 20 49 48.75 | 10.269 | 17 45 13.1 | 40.91 | 13 30.52 | 0.412 | 20 36 18.23 |
| Mon. | 31 | 20 53 54.80 | 10.234 | 17 28 41.4 | 41.70 | 13 40.01 | 0.377 | 20 40 14.79 |
| Tues. | 32 | 20 58 0.01 | 10.199 | S. 17 11 51.3 | +42.46 | 13 48.67 | 0.342 | 20 44 11.34 |

**Note.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.**

Diff. for 1 hour. +9$^s$.8565

## AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | *True* LONGITUDE. | | Diff. for 1 hour. | LATITUDE. | | | |
| | | λ | λ′ | | | | | |
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 1 | 280 29 15.2 | 29 15.7 | 152.94 | −0.18 | 9.9926591 | − 1.3 | 5 17 9.85 |
| 2 | 2 | 281 30 25.6 | 30 25.9 | 152.93 | −0.05 | .9926571 | − 0.4 | 5 13 13.93 |
| 3 | 3 | 282 31 35.8 | 31 35.9 | 152.92 | +0.07 | .9926570 | + 0.5 | 5 9 18.02 |
| 4 | 4 | 283 32 45.8 | 32 45.7 | 152.91 | 0.20 | .9926592 | 1.4 | 5 5 22.11 |
| 5 | 5 | 284 33 55.4 | 33 55.1 | 152.89 | 0.33 | .9926634 | 2.4 | 5 1 26.19 |
| 6 | 6 | 285 35 4.5 | 35 4.0 | 152.87 | 0.44 | .9926702 | 3.4 | 4 57 30.28 |
| 7 | 7 | 286 36 13.2 | 36 12.5 | 152.85 | 0.53 | .9926796 | 4.5 | 4 53 34.37 |
| 8 | 8 | 287 37 21.4 | 37 20.5 | 152.84 | 0.58 | .9926917 | 5.6 | 4 49 38.46 |
| 9 | 9 | 288 38 29.2 | 38 28.1 | 152.82 | 0.62 | .9927064 | 6.8 | 4 45 42.54 |
| 10 | 10 | 289 39 36.6 | 39 35.3 | 152.80 | 0.61 | .9927241 | 8.0 | 4 41 46.63 |
| 11 | 11 | 290 40 43.6 | 40 42.1 | 152.78 | 0.60 | .9927447 | 9.2 | 4 37 50.72 |
| 12 | 12 | 291 41 50.2 | 41 48.6 | 152.77 | 0.55 | .9927682 | 10.3 | 4 33 54.81 |
| 13 | 13 | 292 42 56.5 | 42 54.7 | 152.75 | 0.47 | .9927943 | 11.4 | 4 29 58.89 |
| 14 | 14 | 293 44 2.4 | 44 0.4 | 152.74 | 0.37 | .9928230 | 12.5 | 4 26 2.98 |
| 15 | 15 | 294 45 8.0 | 45 5.8 | 152.72 | 0.25 | .9928545 | 13.7 | 4 22 7.07 |
| 16 | 16 | 295 46 13.3 | 46 11.0 | 152.71 | +0.12 | .9928886 | 14.7 | 4 18 11.15 |
| 17 | 17 | 296 47 18.4 | 47 15.9 | 152.70 | −0.01 | .9929252 | 15.7 | 4 14 15.24 |
| 18 | 18 | 297 48 23.1 | 48 20.4 | 152.69 | 0.14 | .9929643 | 16.7 | 4 10 19.33 |
| 19 | 19 | 298 49 27.5 | 49 24.6 | 152.67 | 0.27 | .9930056 | 17.6 | 4 6 23.42 |
| 20 | 20 | 299 50 31.5 | 50 28.4 | 152.66 | 0.37 | .9930488 | 18.4 | 4 2 27.51 |
| 21 | 21 | 300 51 35.1 | 51 31.8 | 152.64 | 0.44 | .9930940 | 19.1 | 3 58 31.60 |
| 22 | 22 | 301 52 38.2 | 52 34.8 | 152.62 | 0.49 | .9931409 | 19.9 | 3 54 35.69 |
| 23 | 23 | 302 53 40.8 | 53 37.2 | 152.59 | 0.51 | .9931897 | 20.6 | 3 50 39.78 |
| 24 | 24 | 303 54 42.8 | 54 39.0 | 152.56 | 0.50 | .9932401 | 21.2 | 3 46 43.87 |
| 25 | 25 | 304 55 44.0 | 55 40.0 | 152.53 | 0.47 | .9932918 | 21.8 | 3 42 47.95 |
| 26 | 26 | 305 56 44.3 | 56 40.2 | 152.49 | 0.39 | .9933450 | 22.4 | 3 38 52.04 |
| 27 | 27 | 306 57 43.7 | 57 39.4 | 152.45 | 0.30 | .9933996 | 23.0 | 3 34 56.13 |
| 28 | 28 | 307 58 42.1 | 58 37.6 | 152.41 | 0.18 | .9934555 | 23.6 | 3 31 0.22 |
| 29 | 29 | 308 59 39.4 | 59 34.7 | 152.36 | −0.06 | .9935130 | 24.3 | 3 27 4.31 |
| 30 | 30 | 310 0 35.4 | 0 30.6 | 152.31 | +0.07 | .9935720 | 25.0 | 3 23 8.40 |
| 31 | 31 | 311 1 30.2 | 1 25.2 | 152.25 | 0.20 | .9936328 | 25.7 | 3 19 12.49 |
| 32 | 32 | 312 2 23.6 | 2 18.5 | 152.20 | +0.33 | 9.9936953 | +26.4 | 3 15 16.58 |

**Note**: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
—9s.8296

## GREENWICH MEAN TIME.

### THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | MERIDIAN PASSAGE. | | AGE. |
|---|---|---|---|---|---|---|---|---|---|
| | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. | | Diff. for 1 hour. | Noon. |
| | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 15 13.2 | 15 17.9 | 55 44.8 | +1.38 | 56 2.1 | +1.50 | 3 48.3 | 1.81 | 4.7 |
| 2 | 15 23.0 | 15 28.4 | 56 20.8 | 1.61 | 56 40.8 | 1.72 | 4 31.5 | 1.80 | 5.7 |
| 3 | 15 34.2 | 15 40.3 | 57 2.1 | 1.81 | 57 24.5 | 1.91 | 5 14.7 | 1.82 | 6.7 |
| 4 | 15 46.7 | 15 53.2 | 57 47.8 | 1.98 | 58 11.9 | 2.03 | 5 59.2 | 1.91 | 7.7 |
| 5 | 15 59.9 | 16 6.5 | 58 36.3 | 2.04 | 59 0.7 | 2.02 | 6 46.7 | 2.06 | 8.7 |
| 6 | 16 13.0 | 16 19.2 | 59 24.6 | 1.95 | 59 47.4 | 1.84 | 7 38.7 | 2.28 | 9.7 |
| 7 | 16 25.0 | 16 30.1 | 60 8.5 | 1.67 | 60 27.2 | 1.45 | 8 36.2 | 2.53 | 10.7 |
| 8 | 16 34.4 | 16 37.7 | 60 43.0 | 1.17 | 60 55.2 | 0.86 | 9 39.5 | 2.74 | 11.7 |
| 9 | 16 40.0 | 16 41.0 | 61 3.5 | +0.50 | 61 7.2 | +0.12 | 10 46.8 | 2.83 | 12.7 |
| 10 | 16 40.7 | 16 39.2 | 61 6.4 | –0.27 | 61 0.8 | –0.66 | 11 54.2 | 2.76 | 13.7 |
| 11 | 16 36.5 | 16 32.5 | 60 50.7 | 1.03 | 60 36.1 | 1.38 | 12 58.0 | 2.55 | 14.7 |
| 12 | 16 27.5 | 16 21.5 | 60 17.7 | 1.69 | 59 55.8 | 1.95 | 13 56.2 | 2.30 | 15.7 |
| 13 | 16 14.8 | 16 7.5 | 59 31.2 | 2.15 | 59 4.4 | 2.30 | 14 48.6 | 2.08 | 16.7 |
| 14 | 15 59.9 | 15 52.1 | 58 36.3 | 2.38 | 58 7.5 | 2.41 | 15 36.2 | 1.91 | 17.7 |
| 15 | 15 44.2 | 15 36.5 | 57 38.6 | 2.39 | 57 10.3 | 2.33 | 16 20.7 | 1.80 | 18.7 |
| 16 | 15 29.0 | 15 22.0 | 56 42.9 | 2.22 | 56 17.1 | 2.08 | 17 3.4 | 1.76 | 19.7 |
| 17 | 15 15.4 | 15 9.5 | 55 53.1 | 1.91 | 55 31.2 | 1.74 | 17 45.7 | 1.77 | 20.7 |
| 18 | 15 4.1 | 14 59.5 | 55 11.5 | 1.54 | 54 54.2 | 1.34 | 18 28.8 | 1.82 | 21.7 |
| 19 | 14 55.4 | 14 52.1 | 54 39.4 | 1.13 | 54 27.2 | 0.92 | 19 13.6 | 1.91 | 22.7 |
| 20 | 14 49.4 | 14 47.4 | 54 17.4 | 0.72 | 54 10.0 | 0.52 | 20 0.7 | 2.01 | 23.7 |
| 21 | 14 46.0 | 14 45.3 | 54 5.0 | –0.32 | 54 2.4 | –0.13 | 20 50.2 | 2.10 | 24.7 |
| 22 | 14 44.2 | 14 45.6 | 54 1.9 | +0.04 | 54 3.3 | +0.20 | 21 41.4 | 2.16 | 25.7 |
| 23 | 14 46.5 | 14 47.8 | 54 6.6 | 0.34 | 54 11.5 | 0.48 | 22 33.4 | 2.16 | 26.7 |
| 24 | 14 49.5 | 14 51.7 | 54 18.0 | 0.60 | 54 25.8 | 0.70 | 23 24.7 | 2.11 | 27.7 |
| 25 | 14 54.1 | 14 56.9 | 54 34.8 | 0.79 | 54 44.8 | 0.88 | ☌ | | 28.7 |
| 26 | 14 59.9 | 15 3.0 | 54 55.8 | 0.95 | 55 7.5 | 1.01 | 0 14.3 | 2.02 | 29.7 |
| 27 | 15 6.4 | 15 10.0 | 55 19.9 | 1.06 | 55 33.0 | 1.11 | 1 1.8 | 1.93 | 0.9 |
| 28 | 15 13.7 | 15 17.5 | 55 46.6 | 1.15 | 56 0.7 | 1.19 | 1 47.1 | 1.85 | 1.9 |
| 29 | 15 21.5 | 15 25.5 | 56 15.2 | 1.23 | 56 30.2 | 1.27 | 2 30.8 | 1.80 | 2.9 |
| 30 | 15 29.8 | 15 34.1 | 56 45.7 | 1.31 | 57 1.6 | 1.34 | 3 13.9 | 1.80 | 3.9 |
| 31 | 15 38.5 | 15 43.1 | 57 17.8 | 1.37 | 57 34.4 | 1.39 | 3 57.6 | 1.85 | 4.9 |
| 32 | 15 47.6 | 15 52.3 | 57 51.2 | +1.41 | 58 8.3 | +1.43 | 4 43.3 | 1.96 | 5.9 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | SATURDAY 1. | | | | | MONDAY 3. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 22 23 34.38 | 1.9327 | S. 12 43 4.3 | 13.605 | 0 | 23 55 17.83 | 1.9190 | S. 0 53 37.7 | 15.615 |
| 1 | 22 25 30.28 | 1.9307 | 12 29 26.1 | 13.667 | 1 | 23 57 13.02 | 1.9208 | 0 38 0.2 | 15.634 |
| 2 | 22 27 26.07 | 1.9288 | 12 15 44.2 | 13.728 | 2 | 23 59 8.33 | 1.9227 | 0 22 21.6 | 15.652 |
| 3 | 22 29 21.74 | 1.9269 | 12 1 58.7 | 13.788 | 3 | 0 1 3.75 | 1.9246 | S. 0 6 42.0 | 15.669 |
| 4 | 22 31 17.30 | 1.9251 | 11 48 9.6 | 13.848 | 4 | 0 2 59.28 | 1.9265 | N. 0 8 58.6 | 15.685 |
| 5 | 22 33 12.75 | 1.9233 | 11 34 16.9 | 13.908 | 5 | 0 4 54.93 | 1.9286 | 0 24 40.2 | 15.701 |
| 6 | 22 35 8.10 | 1.9217 | 11 20 20.6 | 13.967 | 6 | 0 6 50.71 | 1.9308 | 0 40 22.7 | 15.715 |
| 7 | 22 37 3.35 | 1.9200 | 11 6 20.9 | 14.024 | 7 | 0 8 46.63 | 1.9331 | 0 56 6.0 | 15.728 |
| 8 | 22 38 58.50 | 1.9184 | 10 52 17.8 | 14.080 | 8 | 0 10 42.68 | 1.9354 | 1 11 50.1 | 15.741 |
| 9 | 22 40 53.56 | 1.9170 | 10 38 11.3 | 14.136 | 9 | 0 12 38.88 | 1.9380 | 1 27 34.9 | 15.752 |
| 10 | 22 42 48.54 | 1.9157 | 10 24 1.5 | 14.190 | 10 | 0 14 35.24 | 1.9407 | 1 43 20.4 | 15.762 |
| 11 | 22 44 43.44 | 1.9143 | 10 9 48.5 | 14.243 | 11 | 0 16 31.76 | 1.9433 | 1 59 6.4 | 15.771 |
| 12 | 22 46 38.26 | 1.9131 | 9 55 32.3 | 14.296 | 12 | 0 18 28.44 | 1.9461 | 2 14 52.9 | 15.779 |
| 13 | 22 48 33.01 | 1.9118 | 9 41 12.9 | 14.349 | 13 | 0 20 25.29 | 1.9490 | 2 30 39.9 | 15.786 |
| 14 | 22 50 27.68 | 1.9106 | 9 26 50.4 | 14.400 | 14 | 0 22 22.32 | 1.9519 | 2 46 27.2 | 15.792 |
| 15 | 22 52 22.28 | 1.9096 | 9 12 24.9 | 14.450 | 15 | 0 24 19.52 | 1.9549 | 3 2 14.9 | 15.797 |
| 16 | 22 54 16.83 | 1.9087 | 8 57 56.4 | 14.500 | 16 | 0 26 16.91 | 1.9581 | 3 18 2.8 | 15.800 |
| 17 | 22 56 11.32 | 1.9077 | 8 43 24.9 | 14.549 | 17 | 0 28 14.49 | 1.9613 | 3 33 50.9 | 15.803 |
| 18 | 22 58 5.75 | 1.9068 | 8 28 50.5 | 14.597 | 18 | 0 30 12.26 | 1.9645 | 3 49 39.2 | 15.805 |
| 19 | 23 0 0.13 | 1.9061 | 8 14 13.3 | 14.643 | 19 | 0 32 10.24 | 1.9681 | 4 5 27.5 | 15.805 |
| 20 | 23 1 54.48 | 1.9055 | 7 59 33.3 | 14.690 | 20 | 0 34 8.43 | 1.9717 | 4 21 15.8 | 15.804 |
| 21 | 23 3 48.79 | 1.9048 | 7 44 50.5 | 14.735 | 21 | 0 36 6.84 | 1.9753 | 4 37 4.0 | 15.802 |
| 22 | 23 5 43.06 | 1.9042 | 7 30 5.1 | 14.779 | 22 | 0 38 5.47 | 1.9791 | 4 52 52.0 | 15.798 |
| 23 | 23 7 37.30 | 1.9038 | S. 7 15 17.0 | 14.822 | 23 | 0 40 4.33 | 1.9829 | N. 5 8 39.8 | 15.794 |
| | SUNDAY 2. | | | | | TUESDAY 4. | | | |
| 0 | 23 9 31.52 | 1.9035 | S. 7 0 26.4 | 14.864 | 0 | 0 42 3.42 | 1.9868 | N. 5 24 27.3 | 15.788 |
| 1 | 23 11 25.72 | 1.9032 | 6 45 33.3 | 14.907 | 1 | 0 44 2.75 | 1.9909 | 5 40 14.4 | 15.781 |
| 2 | 23 13 19.90 | 1.9029 | 6 30 37.6 | 14.948 | 2 | 0 46 2.33 | 1.9951 | 5 56 1.0 | 15.773 |
| 3 | 23 15 14.07 | 1.9027 | 6 15 39.5 | 14.987 | 3 | 0 48 2.16 | 1.9993 | 6 11 47.2 | 15.765 |
| 4 | 23 17 8.23 | 1.9027 | 6 0 39.1 | 15.026 | 4 | 0 50 2.24 | 2.0035 | 6 27 32.8 | 15.754 |
| 5 | 23 19 2.39 | 1.9027 | 5 45 36.4 | 15.064 | 5 | 0 52 2.58 | 2.0080 | 6 43 17·7 | 15.742 |
| 6 | 23 20 56.55 | 1.9027 | 5 30 31.4 | 15.102 | 6 | 0 54 3.20 | 2.0126 | 6 59 1.8 | 15.728 |
| 7 | 23 22 50.72 | 1.9029 | 5 15 24.2 | 15.138 | 7 | 0 56 4.09 | 2.0172 | 7 14 45.1 | 15.714 |
| 8 | 23 24 44.90 | 1.9032 | 5 0 14.9 | 15.173 | 8 | 0 58 5.26 | 2.0219 | 7 30 27.5 | 15.698 |
| 9 | 23 26 39.10 | 1.9036 | 4 45 3.5 | 15.208 | 9 | 1 0 6.72 | 2.0267 | 7 46 8.9 | 15.681 |
| 10 | 23 28 33.33 | 1.9041 | 4 29 50.0 | 15.242 | 10 | 1 2 8.47 | 2.0317 | 8 1 49.3 | 15.663 |
| 11 | 23 30 27.59 | 1.9047 | 4 14 34.5 | 15.274 | 11 | 1 4 10.52 | 2.0367 | 8 17 28.5 | 15.643 |
| 12 | 23 32 21.89 | 1.9052 | 3 59 17.1 | 15.306 | 12 | 1 6 12.88 | 2.0419 | 8 33 6.5 | 15.622 |
| 13 | 23 34 16.22 | 1.9059 | 3 43 57.8 | 15.337 | 13 | 1 8 15.55 | 2.0472 | 8 48 43.2 | 15.600 |
| 14 | 23 36 10.60 | 1.9067 | 3 28 36.7 | 15.367 | 14 | 1 10 18.54 | 2.0525 | 9 4 18.5 | 15.576 |
| 15 | 23 38 5.02 | 1.9074 | 3 13 13.8 | 15.396 | 15 | 1 12 21.85 | 2.0579 | 9 19 52.3 | 15.550 |
| 16 | 23 39 59.49 | 1.9083 | 2 57 49.2 | 15.423 | 16 | 1 14 25.49 | 2.0634 | 9 35 24.5 | 15.523 |
| 17 | 23 41 54.02 | 1.9093 | 2 42 23.0 | 15.450 | 17 | 1 16 29.46 | 2.0690 | 9 50 55.1 | 15.495 |
| 18 | 23 43 48.61 | 1.9104 | 2 26 55.2 | 15.477 | 18 | 1 18 33.77 | 2.0747 | 10 6 23.9 | 15.465 |
| 19 | 23 45 43.27 | 1.9117 | 2 11 25.8 | 15.502 | 19 | 1 20 38.43 | 2.0806 | 10 21 50.9 | 15.434 |
| 20 | 23 47 38.01 | 1.9130 | 1 55 55.0 | 15.526 | 20 | 1 22 43.44 | 2.0865 | 10 37 16.0 | 15.402 |
| 21 | 23 49 32.83 | 1.9144 | 1 40 22.7 | 15.550 | 21 | 1 24 48.81 | 2.0926 | 10 52 39.1 | 15.368 |
| 22 | 23 51 27.74 | 1.9159 | 1 24 49.0 | 15.572 | 22 | 1 26 54.55 | 2.0988 | 11 8 0.1 | 15.332 |
| 23 | 23 53 22.74 | 1.9174 | 1 9 14.0 | 15.594 | 23 | 1 29 0.67 | 2.1051 | 11 23 18.9 | 15.295 |
| 24 | 23 55 17.83 | 1.9190 | S. 0 53 37.7 | 15.615 | 24 | 1 31 7.16 | 2.1113 | N. 11 38 35.5 | 15.257 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| WEDNESDAY 5. | | | | | FRIDAY 7. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 1 31 7.16 | 2.1113 | N.11 38 35.5 | 15.257 | 0 | 3 21 22.18 | 2.5072 | N.22 32 12.6 | 11.213 |
| 1 | 1 33 14.03 | 2.1178 | 11 53 49.7 | 15.216 | 1 | 3 23 52.89 | 2.5164 | 22 43 21.3 | 11.077 |
| 2 | 1 35 21.30 | 2.1244 | 12 9 1.4 | 15.173 | 2 | 3 26 24.15 | 2.5256 | 22 54 21.8 | 10.938 |
| 3 | 1 37 28.96 | 2.1309 | 12 24 10.5 | 15.129 | 3 | 3 28 55.96 | 2.5348 | 23 5 13.9 | 10.797 |
| 4 | 1 39 37.01 | 2.1375 | 12 39 16.9 | 15.084 | 4 | 3 31 28.33 | 2.5441 | 23 15 57.5 | 10.655 |
| 5 | 1 41 45.46 | 2.1442 | 12 54 20.6 | 15.037 | 5 | 3 34 1.25 | 2.5532 | 23 26 32.5 | 10.511 |
| 6 | 1 43 54.32 | 2.1512 | 13 9 21.4 | 14.988 | 6 | 3 36 34.72 | 2.5624 | 23 36 58.8 | 10.364 |
| 7 | 1 46 3.60 | 2.1582 | 13 24 19.2 | 14.938 | 7 | 3 39 8.74 | 2.5716 | 23 47 16.2 | 10.214 |
| 8 | 1 48 13.30 | 2.1653 | 13 39 14.0 | 14.887 | 8 | 3 41 43.31 | 2.5807 | 23 57 24.5 | 10.062 |
| 9 | 1 50 23.43 | 2.1726 | 13 54 5.6 | 14.833 | 9 | 3 44 18.42 | 2.5897 | 24 7 23.6 | 9.908 |
| 10 | 1 52 34.01 | 2.1800 | 14 8 53.9 | 14.778 | 10 | 3 46 54.08 | 2.5988 | 24 17 13.4 | 9.752 |
| 11 | 1 54 45.03 | 2.1873 | 14 23 38.9 | 14.721 | 11 | 3 49 30.28 | 2.6079 | 24 26 53.8 | 9.593 |
| 12 | 1 56 56.49 | 2.1947 | 14 38 20.4 | 14.662 | 12 | 3 52 7.03 | 2.6169 | 24 36 24.6 | 9.432 |
| 13 | 1 59 8.40 | 2.2023 | 14 52 58.3 | 14.601 | 13 | 3 54 44.31 | 2.6257 | 24 45 45.7 | 9.270 |
| 14 | 2 1 20.77 | 2.2099 | 15 7 32.5 | 14.538 | 14 | 3 57 22.11 | 2.6343 | 24 54 57.0 | 9.105 |
| 15 | 2 3 33.59 | 2.2175 | 15 22 2.9 | 14.474 | 15 | 4 0 0.43 | 2.6430 | 25 3 58.3 | 8.937 |
| 16 | 2 5 46.87 | 2.2252 | 15 36 29.4 | 14.407 | 16 | 4 2 39.27 | 2.6516 | 25 12 49.5 | 8.768 |
| 17 | 2 8 0.62 | 2.2331 | 15 50 51.8 | 14.339 | 17 | 4 5 18.62 | 2.6600 | 25 21 30.5 | 8.597 |
| 18 | 2 10 14.84 | 2.2410 | 16 5 10.1 | 14.269 | 18 | 4 7 58.47 | 2.6684 | 25 30 1.2 | 8.424 |
| 19 | 2 12 29.54 | 2.2491 | 16 19 24.1 | 14.197 | 19 | 4 10 38.83 | 2.6767 | 25 38 21.4 | 8.248 |
| 20 | 2 14 44.73 | 2 2572 | 16 33 33.8 | 14.124 | 20 | 4 13 19.68 | 2.6850 | 25 46 31.0 | 8.070 |
| 21 | 2 17 0.41 | 2.2655 | 16 47 39.0 | 14.048 | 21 | 4 16 1.03 | 2.6932 | 25 54 29.8 | 7.889 |
| 22 | 2 19 16.59 | 2.2738 | 17 1 39.6 | 13.970 | 22 | 4 18 42.87 | 2.7012 | 26 2 17.7 | 7.707 |
| 23 | 2 21 33.27 | 2.2822 | N.17 15 35.4 | 13.890 | 23 | 4 21 25.18 | 2.7091 | N.26 9 54.7 | 7.524 |
| THURSDAY 6. | | | | | SATURDAY 8. | | | | |
| 0 | 2 23 50.46 | 2.2907 | N.17 29 26.4 | 13.808 | 0 | 4 24 7.96 | 2.7168 | N.26 17 20.6 | 7.338 |
| 1 | 2 26 8.15 | 2.2991 | 17 43 12.4 | 13.725 | 1 | 4 26 51.20 | 2.7244 | 26 24 35.3 | 7.150 |
| 2 | 2 28 26.35 | 2.3076 | 17 56 53.4 | 13.640 | 2 | 4 29 34.89 | 2.7319 | 26 31 38.6 | 6.960 |
| 3 | 2 30 45.06 | 2.3162 | 18 10 29.2 | 13.552 | 3 | 4 32 19.03 | 2.7392 | 26 38 30.5 | 6.768 |
| 4 | 2 33 4.29 | 2.3248 | 18 23 59.7 | 13.462 | 4 | 4 35 3.60 | 2.7464 | 26 45 10.8 | 6.575 |
| 5 | 2 35 24.03 | 2.3334 | 18 37 24.7 | 13.370 | 5 | 4 37 48.60 | 2.7534 | 26 51 39.5 | 6.380 |
| 6 | 2 37 44.30 | 2.3422 | 18 50 44.1 | 13.276 | 6 | 4 40 34.01 | 2.7602 | 26 57 56.4 | 6.182 |
| 7 | 2 40 5.10 | 2.3511 | 19 3 57.8 | 13.180 | 7 | 4 43 19.83 | 2.7670 | 27 4 1.4 | 5.983 |
| 8 | 2 42 26.43 | 2.3600 | 19 17 5.7 | 13.082 | 8 | 4 46 6.05 | 2.7736 | 27 9 54.4 | 5.783 |
| 9 | 2 44 48.30 | 2.3691 | 19 30 7.7 | 12.982 | 9 | 4 48 52.66 | 2.7800 | 27 15 35.4 | 5.582 |
| 10 | 2 47 10.72 | 2.3782 | 19 43 3.6 | 12.879 | 10 | 4 51 39.65 | 2.7862 | 27 21 4.2 | 5.378 |
| 11 | 2 49 33.68 | 2.3872 | 19 55 53.2 | 12.773 | 11 | 4 54 27.01 | 2.7922 | 27 26 20.7 | 5.172 |
| 12 | 2 51 57.18 | 2.3962 | 20 8 36.4 | 12.666 | 12 | 4 57 14.72 | 2.7981 | 27 31 24.8 | 4.964 |
| 13 | 2 54 21.23 | 2.4053 | 20 21 13.1 | 12.557 | 13 | 5 0 2.78 | 2.8037 | 27 36 16.4 | 4.756 |
| 14 | 2 56 45.82 | 2.4144 | 20 33 43.3 | 12.447 | 14 | 5 2 51.17 | 2.8091 | 27 40 55.5 | 4.547 |
| 15 | 2 59 10.96 | 2.4236 | 20 46 6.8 | 12.334 | 15 | 5 5 39.87 | 2.8143 | 27 45 22.0 | 4.336 |
| 16 | 3 1 36.65 | 2.4328 | 20 58 23.4 | 12.218 | 16 | 5 8 28.87 | 2.8192 | 27 49 35.8 | 4.123 |
| 17 | 3 4 2.89 | 2.4420 | 21 10 33.0 | 12.100 | 17 | 5 11 18.17 | 2.8240 | 27 53 36.8 | 3.908 |
| 18 | 3 6 29.69 | 2.4512 | 21 22 35.4 | 11.980 | 18 | 5 14 7.75 | 2.8286 | 27 57 24.8 | 3.693 |
| 19 | 3 8 57.04 | 2.4605 | 21 34 30.6 | 11.857 | 19 | 5 16 57.60 | 2.8330 | 28 0 59.9 | 3.478 |
| 20 | 3 11 24.95 | 2.4698 | 21 46 18.3 | 11.732 | 20 | 5 19 47.71 | 2.8372 | 28 4 22.1 | 3.261 |
| 21 | 3 13 53.42 | 2.4791 | 21 57 58.5 | 11.606 | 21 | 5 22 38.06 | 2.8410 | 28 7 31.2 | 3.042 |
| 22 | 3 16 22.44 | 2.4883 | 22 9 31.0 | 11.477 | 22 | 5 25 28.63 | 2.8447 | 28 10 27.1 | 2.822 |
| 23 | 3 18 52.03 | 2.4978 | 22 20 55.7 | 11.346 | 23 | 5 28 19.42 | 2.8481 | 28 13 9.9 | 2.602 |
| 24 | 3 21 22.18 | 2.5072 | N.22 32 12.6 | 11.213 | 24 | 5 31 10.40 | 2.8512 | N.28 15 39.4 | 2.381 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SUNDAY 9.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 5 31 10.40 | 2.8512 | N.28 15 39.4 | 2.381 |
| 1 | 5 34 1.57 | 2.8542 | 28 17 55.6 | 2.159 |
| 2 | 5 36 52.91 | 2.8570 | 28 19 58.5 | 1.937 |
| 3 | 5 39 44.41 | 2.8595 | 28 21 48.0 | 1.713 |
| 4 | 5 42 36.05 | 2.8617 | 28 23 24.1 | 1.489 |
| 5 | 5 45 27.81 | 2.8637 | 28 24 46.7 | 1.264 |
| 6 | 5 48 19.69 | 2.8654 | 28 25 55.8 | 1.039 |
| 7 | 5 51 11.66 | 2.8668 | 28 26 51.4 | 0.814 |
| 8 | 5 54 3.71 | 2.8680 | 28 27 33.5 | 0.589 |
| 9 | 5 56 55.82 | 2.8689 | 28 28 2.1 | 0.363 |
| 10 | 5 59 47.98 | 2.8697 | 28 28 17.1 | +0.137 |
| 11 | 6 2 40.18 | 2.8701 | 28 28 18.5 | −0.090 |
| 12 | 6 5 32.39 | 2.8703 | 28 28 6.3 | 0.316 |
| 13 | 6 8 24.61 | 2.8702 | 28 27 40.5 | 0.542 |
| 14 | 6 11 16.81 | 2.8698 | 28 27 1.2 | 0.768 |
| 15 | 6 14 8.98 | 2.8692 | 28 26 8.3 | 0.995 |
| 16 | 6 17 1.11 | 2.8683 | 28 25 1.8 | 1.221 |
| 17 | 6 19 53.17 | 2.8671 | 28 23 41.8 | 1.447 |
| 18 | 6 22 45.16 | 2.8657 | 28 22 8.2 | 1.672 |
| 19 | 6 25 37.06 | 2.8641 | 28 20 21.1 | 1.897 |
| 20 | 6 28 28.85 | 2.8622 | 28 18 20.6 | 2.121 |
| 21 | 6 31 20.52 | 2.8600 | 28 16 6.6 | 2.345 |
| 22 | 6 34 12.05 | 2.8577 | 28 13 39.2 | 2.568 |
| 23 | 6 37 3.44 | 2.8551 | N.28 10 58.4 | 2.791 |

### MONDAY 10.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 6 39 54.66 | 2.8522 | N.28 8 4.3 | 3.012 |
| 1 | 6 42 45.70 | 2.8491 | 28 4 56.9 | 3.233 |
| 2 | 6 45 36.55 | 2.8457 | 28 1 36.3 | 3.454 |
| 3 | 6 48 27.18 | 2.8420 | 27 58 2.4 | 3.674 |
| 4 | 6 51 17.59 | 2.8382 | 27 54 15.4 | 3.892 |
| 5 | 6 54 7.76 | 2.8340 | 27 50 15.4 | 4.109 |
| 6 | 6 56 57.67 | 2.8297 | 27 46 2.4 | 4.325 |
| 7 | 6 59 47.32 | 2.8252 | 27 41 36.4 | 4.540 |
| 8 | 7 2 36.69 | 2.8204 | 27 36 57.6 | 4.753 |
| 9 | 7 5 25.77 | 2.8155 | 27 32 6.0 | 4.966 |
| 10 | 7 8 14.55 | 2.8104 | 27 27 1.7 | 5.177 |
| 11 | 7 11 3.02 | 2.8051 | 27 21 44.8 | 5.386 |
| 12 | 7 13 51.16 | 2.7995 | 27 16 15.4 | 5.594 |
| 13 | 7 16 38.96 | 2.7937 | 27 10 33.5 | 5.801 |
| 14 | 7 19 26.40 | 2.7877 | 27 4 39.3 | 6.006 |
| 15 | 7 22 13.48 | 2.7815 | 26 58 32.8 | 6.210 |
| 16 | 7 25 0.18 | 2.7751 | 26 52 14.1 | 6.412 |
| 17 | 7 27 46.49 | 2.7686 | 26 45 43.4 | 6.612 |
| 18 | 7 30 32.41 | 2.7619 | 26 39 0.7 | 6.810 |
| 19 | 7 33 17.92 | 2.7551 | 26 32 6.2 | 7.007 |
| 20 | 7 36 3.02 | 2.7481 | 26 24 59.9 | 7.202 |
| 21 | 7 38 47.69 | 2.7409 | 26 17 42.0 | 7.394 |
| 22 | 7 41 31.93 | 2.7337 | 26 10 12.6 | 7.585 |
| 23 | 7 44 15.73 | 2.7262 | 26 2 31.8 | 7.773 |
| 24 | 7 46 59.07 | 2.7185 | N.25 54 39.8 | 7.960 |

### TUESDAY 11.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 7 46 59.07 | 2.7185 | N.25 54 39.8 | 7.960 |
| 1 | 7 49 41.95 | 2.7107 | 25 46 36.6 | 8.145 |
| 2 | 7 52 24.36 | 2.7028 | 25 38 22.4 | 8.328 |
| 3 | 7 55 6.29 | 2.6948 | 25 29 57.2 | 8.510 |
| 4 | 7 57 47.74 | 2.6867 | 25 21 21.2 | 8.688 |
| 5 | 8 0 28.70 | 2.6785 | 25 12 34.6 | 8.864 |
| 6 | 8 3 9.16 | 2.6701 | 25 3 37.5 | 9.038 |
| 7 | 8 5 49.11 | 2.6616 | 24 54 30.0 | 9.211 |
| 8 | 8 8 28.55 | 2.6531 | 24 45 12.2 | 9.382 |
| 9 | 8 11 7.48 | 2.6445 | 24 35 44.2 | 9.550 |
| 10 | 8 13 45.89 | 2.6358 | 24 26 6.2 | 9.715 |
| 11 | 8 16 23.78 | 2.6271 | 24 16 18.4 | 9.877 |
| 12 | 8 19 1.14 | 2.6182 | 24 6 20.9 | 10.038 |
| 13 | 8 21 37.97 | 2.6093 | 23 56 13.8 | 10.197 |
| 14 | 8 24 14.26 | 2.6003 | 23 45 57.3 | 10.353 |
| 15 | 8 26 50.00 | 2.5912 | 23 35 31.4 | 10.508 |
| 16 | 8 29 25.20 | 2.5820 | 23 24 56.3 | 10.660 |
| 17 | 8 31 59.84 | 2.5728 | 23 14 12.2 | 10.809 |
| 18 | 8 34 33.93 | 2.5636 | 23 3 19.3 | 10.955 |
| 19 | 8 37 7.47 | 2.5543 | 22 52 17.6 | 11.100 |
| 20 | 8 39 40.45 | 2.5451 | 22 41 7.3 | 11.242 |
| 21 | 8 42 12.88 | 2.5358 | 22 29 48.5 | 11.382 |
| 22 | 8 44 44.75 | 2.5265 | 22 18 21.4 | 11.519 |
| 23 | 8 47 16.06 | 2.5172 | N.22 6 46.2 | 11.654 |

### WEDNESDAY 12.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 8 49 46.81 | 2.5078 | N.21 55 2.9 | 11.787 |
| 1 | 8 52 17.00 | 2.4984 | 21 43 11.7 | 11.917 |
| 2 | 8 54 46.62 | 2.4890 | 21 31 12.8 | 12.045 |
| 3 | 8 57 15.68 | 2.4796 | 21 19 6.3 | 12.171 |
| 4 | 8 59 44.17 | 2.4702 | 21 6 52.3 | 12.294 |
| 5 | 9 2 12.10 | 2.4608 | 20 54 31.0 | 12.415 |
| 6 | 9 4 39.47 | 2.4514 | 20 42 2.5 | 12.533 |
| 7 | 9 7 6.27 | 2.4421 | 20 29 27.0 | 12.649 |
| 8 | 9 9 32.51 | 2.4327 | 20 16 44.6 | 12.762 |
| 9 | 9 11 58.19 | 2.4234 | 20 3 55.5 | 12.873 |
| 10 | 9 14 23.32 | 2.4141 | 19 50 59.8 | 12.982 |
| 11 | 9 16 47.89 | 2.4049 | 19 37 57.6 | 13.090 |
| 12 | 9 19 11.91 | 2.3957 | 19 24 49.0 | 13.195 |
| 13 | 9 21 35.38 | 2.3865 | 19 11 34.2 | 13.297 |
| 14 | 9 23 58.29 | 2.3773 | 18 58 13.4 | 13.395 |
| 15 | 9 26 20.65 | 2.3681 | 18 44 46.8 | 13.492 |
| 16 | 9 28 42.46 | 2.3590 | 18 31 14.4 | 13.587 |
| 17 | 9 31 3.73 | 2.3500 | 18 17 36.3 | 13.681 |
| 18 | 9 33 24.46 | 2.3410 | 18 3 52.7 | 13.772 |
| 19 | 9 35 44.65 | 2.3321 | 17 50 3.7 | 13.860 |
| 20 | 9 38 4.31 | 2.3232 | 17 36 9.5 | 13.945 |
| 21 | 9 40 23.44 | 2.3144 | 17 22 10.3 | 14.028 |
| 22 | 9 42 42.04 | 2.3057 | 17 8 6.1 | 14.111 |
| 23 | 9 45 0.12 | 2.2970 | 16 53 57.0 | 14.192 |
| 24 | 9 47 17.68 | 2.2883 | N.16 39 43.1 | 14.269 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### THURSDAY 13.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
|  | h m s | s | ° ′ ″ | ″ |
| 0 | 9 47 17.68 | 2.2883 | N.16 39 43.1 | 14.269 |
| 1 | 9 49 34.73 | 2.2797 | 16 25 24.7 | 14.343 |
| 2 | 9 51 51.26 | 2.2712 | 16 11 1.9 | 14.417 |
| 3 | 9 54 7.28 | 2.2628 | 15 56 34.7 | 14.488 |
| 4 | 9 56 22.79 | 2.2544 | 15 42 3.3 | 14.557 |
| 5 | 9 58 37.80 | 2.2461 | 15 27 27.8 | 14.624 |
| 6 | 10 0 52.32 | 2.2379 | 15 12 48.4 | 14.688 |
| 7 | 10 3 6.35 | 2.2297 | 14 58 5.2 | 14.752 |
| 8 | 10 5 19.89 | 2.2217 | 14 43 18.2 | 14.813 |
| 9 | 10 7 32.95 | 2.2137 | 14 28 27.6 | 14.872 |
| 10 | 10 9 45.54 | 2.2059 | 14 13 33.6 | 14.928 |
| 11 | 10 11 57.66 | 2.1981 | 13 58 36.2 | 14.983 |
| 12 | 10 14 9.31 | 2.1904 | 13 43 35.6 | 15.036 |
| 13 | 10 16 20.50 | 2.1827 | 13 28 31.9 | 15.087 |
| 14 | 10 18 31.23 | 2.1751 | 13 13 25.1 | 15.137 |
| 15 | 10 20 41.51 | 2.1676 | 12 58 15.4 | 15.185 |
| 16 | 10 22 51.34 | 2.1602 | 12 43 2.9 | 15.230 |
| 17 | 10 25 0.73 | 2.1529 | 12 27 47.8 | 15.273 |
| 18 | 10 27 9.69 | 2.1457 | 12 12 30.1 | 15.316 |
| 19 | 10 29 18.22 | 2.1386 | 11 57 9.9 | 15.356 |
| 20 | 10 31 26.32 | 2.1316 | 11 41 47.4 | 15.394 |
| 21 | 10 33 34.00 | 2.1247 | 11 26 22.6 | 15.432 |
| 22 | 10 35 41.27 | 2.1179 | 11 10 55.6 | 15.467 |
| 23 | 10 37 48.14 | 2.1111 | N.10 55 26.6 | 15.499 |

### FRIDAY 14.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 10 39 54.61 | 2.1044 | N.10 39 55.7 | 15.531 |
| 1 | 10 42 0.68 | 2.0978 | 10 24 22.9 | 15.561 |
| 2 | 10 44 6.35 | 2.0913 | 10 8 48.4 | 15.589 |
| 3 | 10 46 11.64 | 2.0850 | 9 53 12.2 | 15.616 |
| 4 | 10 48 16.55 | 2.0788 | 9 37 34.5 | 15.641 |
| 5 | 10 50 21.09 | 2.0726 | 9 21 55.3 | 15.665 |
| 6 | 10 52 25.26 | 2.0665 | 9 6 14.7 | 15.687 |
| 7 | 10 54 29.07 | 2.0605 | 8 50 32.8 | 15.707 |
| 8 | 10 56 32.52 | 2.0546 | 8 34 49.8 | 15.726 |
| 9 | 10 58 35.61 | 2.0487 | 8 19 5.7 | 15.743 |
| 10 | 11 0 38.36 | 2.0430 | 8 3 20.6 | 15.759 |
| 11 | 11 2 40.78 | 2.0375 | 7 47 34.6 | 15.773 |
| 12 | 11 4 42.87 | 2.0320 | 7 31 47.8 | 15.786 |
| 13 | 11 6 44.63 | 2.0266 | 7 16 0.3 | 15.797 |
| 14 | 11 8 46.06 | 2.0213 | 7 0 12.1 | 15.808 |
| 15 | 11 10 47.18 | 2.0161 | 6 44 23.3 | 15.817 |
| 16 | 11 12 47.99 | 2.0111 | 6 28 34.0 | 15.825 |
| 17 | 11 14 48.50 | 2.0061 | 6 12 44.3 | 15.831 |
| 18 | 11 16 48.72 | 2.0012 | 5 56 54.3 | 15.836 |
| 19 | 11 18 48.65 | 1.9963 | 5 41 4.0 | 15.839 |
| 20 | 11 20 48.28 | 1.9915 | 5 25 13.6 | 15.841 |
| 21 | 11 22 47.63 | 1.9869 | 5 9 23.1 | 15.842 |
| 22 | 11 24 46.71 | 1.9824 | 4 53 32.6 | 15.842 |
| 23 | 11 26 45.52 | 1.9780 | 4 37 42.1 | 15.840 |
| 24 | 11 28 44.07 | 1.9737 | N. 4 21 51.8 | 15.837 |

### SATURDAY 15.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
|  | h m s | s | ° ′ ″ | ″ |
| 0 | 11 28 44.07 | 1.9737 | N. 4 21 51.8 | 15.837 |
| 1 | 11 30 42.36 | 1.9694 | 4 6 1.7 | 15.832 |
| 2 | 11 32 40.40 | 1.9652 | 3 50 11.9 | 15.827 |
| 3 | 11 34 38.19 | 1.9612 | 3 34 22.4 | 15.821 |
| 4 | 11 36 35.75 | 1.9573 | 3 18 33.4 | 15.813 |
| 5 | 11 38 33.08 | 1.9536 | 3 2 44.9 | 15.804 |
| 6 | 11 40 30.18 | 1.9499 | 2 46 56.9 | 15.794 |
| 7 | 11 42 27.06 | 1.9462 | 2 31 9.6 | 15.783 |
| 8 | 11 44 23.72 | 1.9426 | 2 15 23.0 | 15.771 |
| 9 | 11 46 20.16 | 1.9391 | 1 59 37.1 | 15.758 |
| 10 | 11 48 16.40 | 1.9357 | 1 43 52.0 | 15.743 |
| 11 | 11 50 12.45 | 1.9325 | 1 28 7.9 | 15.728 |
| 12 | 11 52 8.31 | 1.9293 | 1 12 24.7 | 15.712 |
| 13 | 11 54 3.98 | 1.9262 | 0 56 42.5 | 15.694 |
| 14 | 11 55 59.46 | 1.9232 | 0 41 1.4 | 15.675 |
| 15 | 11 57 54.76 | 1.9203 | 0 25 21.5 | 15.655 |
| 16 | 11 59 49.90 | 1.9175 | N. 0 9 42.8 | 15.634 |
| 17 | 12 1 44.88 | 1.9149 | S. 0 5 54.6 | 15.613 |
| 18 | 12 3 39.70 | 1.9123 | 0 21 30.8 | 15.592 |
| 19 | 12 5 34.36 | 1.9097 | 0 37 5.6 | 15.568 |
| 20 | 12 7 28.86 | 1.9072 | 0 52 38.9 | 15.543 |
| 21 | 12 9 23.22 | 1.9049 | 1 8 10.7 | 15.517 |
| 22 | 12 11 17.45 | 1.9027 | 1 23 40.9 | 15.490 |
| 23 | 12 13 11.55 | 1.9005 | S. 1 39 9.5 | 15.463 |

### SUNDAY 16.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 12 15 5.51 | 1.8984 | S. 1 54 36.5 | 15.436 |
| 1 | 12 16 59.35 | 1.8964 | 2 10 1.8 | 15.406 |
| 2 | 12 18 53.07 | 1.8945 | 2 25 25.2 | 15.375 |
| 3 | 12 20 46.69 | 1.8927 | 2 40 46.8 | 15.344 |
| 4 | 12 22 40.21 | 1.8911 | 2 56 6.5 | 15.312 |
| 5 | 12 24 33.63 | 1.8895 | 3 11 24.3 | 15.280 |
| 6 | 12 26 26.95 | 1.8880 | 3 26 40.1 | 15.247 |
| 7 | 12 28 20.18 | 1.8865 | 3 41 53.9 | 15.212 |
| 8 | 12 30 13.33 | 1.8851 | 3 57 5.5 | 15.176 |
| 9 | 12 32 6.40 | 1.8838 | 4 12 15.0 | 15.140 |
| 10 | 12 33 59.39 | 1.8826 | 4 27 22.3 | 15.103 |
| 11 | 12 35 52.31 | 1.8814 | 4 42 27.4 | 15.066 |
| 12 | 12 37 45.16 | 1.8803 | 4 57 30.2 | 15.027 |
| 13 | 12 39 37.95 | 1.8794 | 5 12 30.7 | 14.987 |
| 14 | 12 41 30.69 | 1.8786 | 5 27 28.7 | 14.947 |
| 15 | 12 43 23.39 | 1.8779 | 5 42 24.3 | 14.906 |
| 16 | 12 45 16.04 | 1.8773 | 5 57 17.4 | 14.864 |
| 17 | 12 47 8.66 | 1.8767 | 6 12 8.0 | 14.822 |
| 18 | 12 49 1.24 | 1.8761 | 6 26 56.0 | 14.778 |
| 19 | 12 50 53.79 | 1.8757 | 6 41 41.4 | 14.734 |
| 20 | 12 52 46.32 | 1.8753 | 6 56 24.1 | 14.689 |
| 21 | 12 54 38.82 | 1.8749 | 7 11 4.1 | 14.643 |
| 22 | 12 56 31.31 | 1.8747 | 7 25 41.3 | 14.597 |
| 23 | 12 58 23.79 | 1.8746 | 7 40 15.7 | 14.550 |
| 24 | 13 0 16.26 | 1.8746 | S. 7 54 47.3 | 14.502 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | **MONDAY 17.** | | | | | **WEDNESDAY 19.** | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 13 0 16.26 | 1.8746 | S. 7 54 47.3 | 14.502 | 0 | 14 31 33.17 | 1.9532 | S. 18 22 0.1 | 11.364 |
| 1 | 13 2 8.73 | 1.8746 | 8 9 16.0 | 14.453 | 1 | 14 33 30.45 | 1.9563 | 18 33 19.5 | 11.282 |
| 2 | 13 4 1.21 | 1.8747 | 8 23 41.7 | 14.403 | 2 | 14 35 27.92 | 1.9594 | 18 44 33.9 | 11.198 |
| 3 | 13 5 53.69 | 1.8748 | 8 38 4.4 | 14.353 | 3 | 14 37 25.58 | 1.9625 | 18 55 43.2 | 11.113 |
| 4 | 13 7 46.19 | 1.8751 | 8 52 24.0 | 14.302 | 4 | 14 39 23.42 | 1.9657 | 19 6 47.5 | 11.029 |
| 5 | 13 9 38.71 | 1.8755 | 9 6 40.6 | 14.250 | 5 | 14 41 21.46 | 1.9689 | 19 17 46.7 | 10.943 |
| 6 | 13 11 31.25 | 1.8759 | 9 20 54.0 | 14.198 | 6 | 14 43 19.69 | 1.9722 | 19 28 40.7 | 10.857 |
| 7 | 13 13 23.82 | 1.8764 | 9 35 4.3 | 14.145 | 7 | 14 45 18.12 | 1.9754 | 19 39 29.5 | 10.770 |
| 8 | 13 15 16.42 | 1.8770 | 9 49 11.4 | 14.092 | 8 | 14 47 16.74 | 1.9787 | 19 50 13.1 | 10.683 |
| 9 | 13 17 9.06 | 1.8776 | 10 3 15.3 | 14.037 | 9 | 14 49 15.56 | 1.9821 | 20 0 51.5 | 10.596 |
| 10 | 13 19 1.73 | 1.8783 | 10 17 15.9 | 13.982 | 10 | 14 51 14.59 | 1.9855 | 20 11 24.6 | 10.507 |
| 11 | 13 20 54.45 | 1.8791 | 10 31 13.1 | 13.925 | 11 | 14 53 13.82 | 1.9888 | 20 21 52.3 | 10.416 |
| 12 | 13 22 47.22 | 1.8799 | 10 45 6.9 | 13.868 | 12 | 14 55 13.25 | 1.9922 | 20 32 14.5 | 10.325 |
| 13 | 13 24 40.04 | 1.8808 | 10 58 57.3 | 13.811 | 13 | 14 57 12.89 | 1.9957 | 20 42 31.3 | 10.234 |
| 14 | 13 26 32.92 | 1.8818 | 11 12 44.3 | 13.753 | 14 | 14 59 12.74 | 1.9993 | 20 52 42.6 | 10.143 |
| 15 | 13 28 25.86 | 1.8829 | 11 26 27.7 | 13.694 | 15 | 15 1 12.81 | 2.0029 | 21 2 48.5 | 10.052 |
| 16 | 13 30 18.87 | 1.8841 | 11 40 7.6 | 13.635 | 16 | 15 3 13.09 | 2.0065 | 21 12 48.8 | 9.958 |
| 17 | 13 32 11.95 | 1.8853 | 11 53 43.9 | 13.574 | 17 | 15 5 13.59 | 2.0102 | 21 22 43.4 | 9.863 |
| 18 | 13 34 5.11 | 1.8866 | 12 7 16.5 | 13.513 | 18 | 15 7 14.31 | 2.0138 | 21 32 32.4 | 9.769 |
| 19 | 13 35 58.34 | 1.8879 | 12 20 45.4 | 13.452 | 19 | 15 9 15.25 | 2.0174 | 21 42 15.7 | 9.673 |
| 20 | 13 37 51.66 | 1.8893 | 12 34 10.7 | 13.391 | 20 | 15 11 16.40 | 2.0210 | 21 51 53.2 | 9.577 |
| 21 | 13 39 45.06 | 1.8907 | 12 47 32.3 | 13.328 | 21 | 15 13 17.77 | 2.0247 | 22 1 24.9 | 9.480 |
| 22 | 13 41 38.55 | 1.8922 | 13 0 50.1 | 13.264 | 22 | 15 15 19.37 | 2.0285 | 22 10 50.8 | 9.382 |
| 23 | 13 43 32.14 | 1.8939 | S. 13 14 4.0 | 13.198 | 23 | 15 17 21.19 | 2.0322 | S. 22 20 10.8 | 9.284 |
| | **TUESDAY 18.** | | | | | **THURSDAY 20.** | | | |
| 0 | 13 45 25.82 | 1.8956 | S. 13 27 13.9 | 13.133 | 0 | 15 19 23.23 | 2.0359 | S. 22 29 24.9 | 9.185 |
| 1 | 13 47 19.61 | 1.8973 | 13 40 19.9 | 13.068 | 1 | 15 21 25.50 | 2.0397 | 22 38 33.0 | 9.085 |
| 2 | 13 49 13.50 | 1.8991 | 13 53 22.0 | 13.002 | 2 | 15 23 27.99 | 2.0434 | 22 47 35.1 | 8.985 |
| 3 | 13 51 7.50 | 1.9010 | 14 6 20.1 | 12.934 | 3 | 15 25 30.71 | 2.0472 | 22 56 31.2 | 8.884 |
| 4 | 13 53 1.62 | 1.9029 | 14 19 14.1 | 12.866 | 4 | 15 27 33.66 | 2.0511 | 23 5 21.2 | 8.782 |
| 5 | 13 54 55.85 | 1.9048 | 14 32 4.1 | 12.798 | 5 | 15 29 36.84 | 2.0549 | 23 14 5.0 | 8.678 |
| 6 | 13 56 50.20 | 1.9069 | 14 44 49.9 | 12.728 | 6 | 15 31 40.25 | 2.0587 | 23 22 42.6 | 8.575 |
| 7 | 13 58 44.68 | 1.9090 | 14 57 31.5 | 12.658 | 7 | 15 33 43.89 | 2.0626 | 23 31 14.0 | 8.471 |
| 8 | 14 0 39.28 | 1.9111 | 15 10 8.9 | 12.588 | 8 | 15 35 47.76 | 2.0664 | 23 39 39.1 | 8.367 |
| 9 | 14 2 34.01 | 1.9133 | 15 22 42.1 | 12.517 | 9 | 15 37 51.86 | 2.0702 | 23 47 58.0 | 8.261 |
| 10 | 14 4 28.88 | 1.9157 | 15 35 11.0 | 12.445 | 10 | 15 39 56.19 | 2.0740 | 23 56 10.5 | 8.154 |
| 11 | 14 6 23.90 | 1.9182 | 15 47 35.5 | 12.372 | 11 | 15 42 0.74 | 2.0778 | 24 4 16.5 | 8.047 |
| 12 | 14 8 19.07 | 1.9206 | 15 59 55.6 | 12.298 | 12 | 15 44 5.52 | 2.0816 | 24 12 16.1 | 7.939 |
| 13 | 14 10 14.38 | 1.9230 | 16 12 11.3 | 12.224 | 13 | 15 46 10.53 | 2.0855 | 24 20 9.2 | 7.831 |
| 14 | 14 12 9.83 | 1.9254 | 16 24 22.5 | 12.150 | 14 | 15 48 15.78 | 2.0894 | 24 27 55.8 | 7.722 |
| 15 | 14 14 5.43 | 1.9280 | 16 36 29.3 | 12.075 | 15 | 15 50 21.26 | 2.0933 | 24 35 35.8 | 7.612 |
| 16 | 14 16 1.19 | 1.9306 | 16 48 31.5 | 11.998 | 16 | 15 52 26.97 | 2.0971 | 24 43 9.2 | 7.501 |
| 17 | 14 17 57.10 | 1.9332 | 17 0 29.1 | 11.921 | 17 | 15 54 32.91 | 2.1008 | 24 50 35.9 | 7.390 |
| 18 | 14 19 53.17 | 1.9359 | 17 12 22.0 | 11.843 | 18 | 15 56 39.07 | 2.1046 | 24 57 56.0 | 7.278 |
| 19 | 14 21 49.41 | 1.9387 | 17 24 10.2 | 11.765 | 19 | 15 58 45.46 | 2.1084 | 25 5 9.3 | 7.165 |
| 20 | 14 23 45.81 | 1.9415 | 17 35 53.8 | 11.687 | 20 | 16 0 52.08 | 2.1122 | 25 12 15.8 | 7.052 |
| 21 | 14 25 42.39 | 1.9444 | 17 47 32.6 | 11.607 | 21 | 16 2 58.93 | 2.1160 | 25 19 15.5 | 6.937 |
| 22 | 14 27 39.14 | 1.9473 | 17 59 6.6 | 11.527 | 22 | 16 5 6.00 | 2.1197 | 25 26 8.3 | 6.822 |
| 23 | 14 29 36.07 | 1.9502 | 18 10 35.8 | 11.446 | 23 | 16 7 13.29 | 2.1234 | 25 32 54.2 | 6.707 |
| 24 | 14 31 33.17 | 1.9532 | S. 18 22 0.1 | 11.364 | 24 | 16 9 20.81 | 2.1271 | S. 25 39 33.2 | 6.591 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### FRIDAY 21.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 16 9 20.81 | 2.1271 | S. 25 39 33.2 | 6.591 |
| 1 | 16 11 28.55 | 2.1308 | 25 46 5.2 | 6.474 |
| 2 | 16 13 36.51 | 2.1345 | 25 52 30.1 | 6.357 |
| 3 | 16 15 44.69 | 2.1382 | 25 58 48.0 | 6.239 |
| 4 | 16 17 53.09 | 2.1418 | 26 4 58.8 | 6.120 |
| 5 | 16 20 1.70 | 2.1453 | 26 11 2.4 | 5.999 |
| 6 | 16 22 10.52 | 2.1488 | 26 16 58.7 | 5.878 |
| 7 | 16 24 19.55 | 2.1523 | 26 22 47.8 | 5.758 |
| 8 | 16 26 28.80 | 2.1559 | 26 28 29.7 | 5.637 |
| 9 | 16 28 38.26 | 2.1593 | 26 34 4.3 | 5.516 |
| 10 | 16 30 47.92 | 2.1627 | 26 39 31.6 | 5.393 |
| 11 | 16 32 57.78 | 2.1660 | 26 44 51.5 | 5.269 |
| 12 | 16 35 7.84 | 2.1693 | 26 50 3.9 | 5.144 |
| 13 | 16 37 18.10 | 2.1726 | 26 55 8.8 | 5.020 |
| 14 | 16 39 28.56 | 2.1759 | 27 0 6.3 | 4.896 |
| 15 | 16 41 39.21 | 2.1792 | 27 4 56.3 | 4.770 |
| 16 | 16 43 50.06 | 2.1823 | 27 9 38.7 | 4.643 |
| 17 | 16 46 1.09 | 2.1854 | 27 14 13.5 | 4.517 |
| 18 | 16 48 12.31 | 2.1885 | 27 18 40.7 | 4.389 |
| 19 | 16 50 23.71 | 2.1915 | 27 23 0.2 | 4.261 |
| 20 | 16 52 35.29 | 2.1944 | 27 27 12.0 | 4.132 |
| 21 | 16 54 47.04 | 2.1973 | 27 31 16.1 | 4.003 |
| 22 | 16 56 58.97 | 2.2002 | 27 35 12.4 | 3.873 |
| 23 | 16 59 11.06 | 2.2029 | S. 27 39 0.9 | 3.743 |

### SATURDAY 22.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 17 1 23.32 | 2.2056 | S. 27 42 41.6 | 3.612 |
| 1 | 17 3 35.74 | 2.2083 | 27 46 14.4 | 3.481 |
| 2 | 17 5 48.32 | 2.2109 | 27 49 39.3 | 3.350 |
| 3 | 17 8 1.05 | 2.2135 | 27 52 56.4 | 3.218 |
| 4 | 17 10 13.94 | 2.2161 | 27 56 5.5 | 3.085 |
| 5 | 17 12 26.98 | 2.2185 | 27 59 6.6 | 2.952 |
| 6 | 17 14 40.16 | 2.2208 | 28 1 59.7 | 2.818 |
| 7 | 17 16 53.48 | 2.2231 | 28 4 44.8 | 2.684 |
| 8 | 17 19 6.93 | 2.2253 | 28 7 21.8 | 2.550 |
| 9 | 17 21 20.51 | 2.2274 | 28 9 50.8 | 2.416 |
| 10 | 17 23 34.22 | 2.2295 | 28 12 11.7 | 2.280 |
| 11 | 17 25 48.05 | 2.2314 | 28 14 24.4 | 2.144 |
| 12 | 17 28 1.99 | 2.2333 | 28 16 29.0 | 2.009 |
| 13 | 17 30 16.05 | 2.2352 | 28 18 25.5 | 1.872 |
| 14 | 17 32 30.21 | 2.2369 | 28 20 13.7 | 1.735 |
| 15 | 17 34 44.48 | 2.2386 | 28 21 53.7 | 1.598 |
| 16 | 17 36 58.85 | 2.2403 | 28 23 25.5 | 1.462 |
| 17 | 17 39 13.32 | 2.2419 | 28 24 49.1 | 1.324 |
| 18 | 17 41 27.88 | 2.2433 | 28 26 4.4 | 1.187 |
| 19 | 17 43 42.52 | 2.2447 | 28 27 11.5 | 1.048 |
| 20 | 17 45 57.25 | 2.2461 | 28 28 10.2 | 0.909 |
| 21 | 17 48 12.05 | 2.2472 | 28 29 0.6 | 0.771 |
| 22 | 17 50 26.92 | 2.2183 | 28 29 42.7 | 0.632 |
| 23 | 17 52 41.85 | 2.2493 | 28 30 16.5 | 0.493 |
| 24 | 17 54 56.84 | 2.2503 | S. 28 30 41.9 | 0.353 |

### SUNDAY 23.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 17 54 56.84 | 2.2503 | S. 28 30 41.9 | 0.353 |
| 1 | 17 57 11.88 | 2.2512 | 28 30 58.9 | 0.214 |
| 2 | 17 59 26.98 | 2.2520 | 28 31 7.6 | −0.076 |
| 3 | 18 1 42.12 | 2.2528 | 28 31 8.0 | +0.063 |
| 4 | 18 3 57.31 | 2.2535 | 28 31 0.0 | 0.203 |
| 5 | 18 6 12.54 | 2.2541 | 28 30 43.6 | 0.344 |
| 6 | 18 8 27.80 | 2.2546 | 28 30 18.7 | 0.485 |
| 7 | 18 10 43.09 | 2.2549 | 28 29 45.4 | 0.624 |
| 8 | 18 12 58.39 | 2.2552 | 28 29 3.8 | 0.763 |
| 9 | 18 15 13.71 | 2.2553 | 28 28 13.8 | 0.903 |
| 10 | 18 17 29.03 | 2.2553 | 28 27 15.4 | 1.044 |
| 11 | 18 19 44.35 | 2.2553 | 28 26 8.5 | 1.185 |
| 12 | 18 21 59.67 | 2.2553 | 28 24 53.2 | 1.325 |
| 13 | 18 24 14.99 | 2.2552 | 28 23 29.5 | 1.465 |
| 14 | 18 26 30.30 | 2.2550 | 28 21 57.4 | 1.605 |
| 15 | 18 28 45.59 | 2.2547 | 28 20 16.9 | 1.745 |
| 16 | 18 31 0.86 | 2.2543 | 28 18 28.0 | 1.885 |
| 17 | 18 33 16.11 | 2.2539 | 28 16 30.7 | 2.025 |
| 18 | 18 35 31.33 | 2.2533 | 28 14 25.0 | 2.165 |
| 19 | 18 37 46.51 | 2.2527 | 28 12 10.9 | 2.304 |
| 20 | 18 40 1.65 | 2.2519 | 28 9 48.5 | 2.443 |
| 21 | 18 42 16.74 | 2.2511 | 28 7 17.7 | 2.583 |
| 22 | 18 44 31.78 | 2.2502 | 28 4 38.5 | 2.722 |
| 23 | 18 46 46.76 | 2.2491 | S. 28 1 51.0 | 2.862 |

### MONDAY 24.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 18 49 1.67 | 2.2480 | S. 27 58 55.1 | 3.001 |
| 1 | 18 51 16.52 | 2.2469 | 27 55 50.9 | 3.139 |
| 2 | 18 53 31.30 | 2.2456 | 27 52 38.4 | 3.278 |
| 3 | 18 55 46.00 | 2.2443 | 27 49 17.6 | 3.416 |
| 4 | 18 58 0.62 | 2.2430 | 27 45 48.5 | 3.553 |
| 5 | 19 0 15.16 | 2.2417 | 27 42 11.2 | 3.691 |
| 6 | 19 2 29.62 | 2.2402 | 27 38 25.6 | 3.828 |
| 7 | 19 4 43.98 | 2.2385 | 27 34 31.8 | 3.965 |
| 8 | 19 6 58.24 | 2.2367 | 27 30 29.8 | 4.102 |
| 9 | 19 9 12.39 | 2.2349 | 27 26 19.6 | 4.238 |
| 10 | 19 11 26.43 | 2.2330 | 27 22 1.2 | 4.374 |
| 11 | 19 13 40.35 | 2.2310 | 27 17 34.7 | 4.509 |
| 12 | 19 15 54.15 | 2.2290 | 27 13 0.1 | 4.644 |
| 13 | 19 18 7.83 | 2.2270 | 27 8 17.4 | 4.779 |
| 14 | 19 20 21.39 | 2.2249 | 27 3 26.6 | 4.914 |
| 15 | 19 22 34.82 | 2.2228 | 26 58 27.7 | 5.048 |
| 16 | 19 24 48.13 | 2.2206 | 26 53 20.8 | 5.181 |
| 17 | 19 27 1.30 | 2.2183 | 26 48 6.0 | 5.313 |
| 18 | 19 29 14.33 | 2.2159 | 26 42 43.2 | 5.446 |
| 19 | 19 31 27.21 | 2.2135 | 26 37 12.5 | 5.578 |
| 20 | 19 33 39.95 | 2.2110 | 26 31 33.9 | 5.709 |
| 21 | 19 35 52.53 | 2.2084 | 26 25 47.4 | 5.840 |
| 22 | 19 38 4.95 | 2.2057 | 26 19 53.1 | 5.971 |
| 23 | 19 40 17.21 | 2.2029 | 26 13 50.9 | 6.101 |
| 24 | 19 42 29.30 | 2.2002 | S. 26 7 41.0 | 6.229 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | **TUESDAY 25.** | | | | | **THURSDAY 27.** | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 19 42 29.30 | 2.2002 | S. 26 7 41.0 | 6.229 | 0 | 21 24 17.68 | 2.0360 | S. 18 53 10.7 | 11.563 |
| 1 | 19 44 41.23 | 2.1974 | 26 1 23.4 | 6.358 | 1 | 21 26 19.74 | 2.0326 | 18 41 34.2 | 11.653 |
| 2 | 19 46 52.99 | 2.1946 | 25 54 58.0 | 6.486 | 2 | 21 28 21.59 | 2.0292 | 18 29 52.3 | 11.742 |
| 3 | 19 49 4.58 | 2.1917 | 25 48 25.0 | 6.613 | 3 | 21 30 23.24 | 2.0258 | 18 18 5.1 | 11.831 |
| 4 | 19 51 16.00 | 2.1889 | 25 41 44.4 | 6.740 | 4 | 21 32 24.69 | 2.0225 | 18 6 12.6 | 11.918 |
| 5 | 19 53 27.25 | 2.1860 | 25 34 56.2 | 6.867 | 5 | 21 34 25.94 | 2.0192 | 17 54 14.9 | 12.004 |
| 6 | 19 55 38.32 | 2.1829 | 25 28 0.4 | 6.992 | 6 | 21 36 27.00 | 2.0160 | 17 42 12.1 | 12.089 |
| 7 | 19 57 49.20 | 2.1798 | 25 20 57.1 | 7.117 | 7 | 21 38 27.86 | 2.0127 | 17 30 4.2 | 12.173 |
| 8 | 19 59 59.89 | 2.1766 | 25 13 46.3 | 7.242 | 8 | 21 40 28.52 | 2.0094 | 17 17 51.3 | 12.257 |
| 9 | 20 2 10.39 | 2.1734 | 25 6 28.1 | 7.365 | 9 | 21 42 28.98 | 2.0061 | 17 5 33.3 | 12.341 |
| 10 | 20 4 20.70 | 2.1702 | 24 59 2.5 | 7.487 | 10 | 21 44 29.25 | 2.0028 | 16 53 10.4 | 12.422 |
| 11 | 20 6 30.81 | 2.1669 | 24 51 29.6 | 7.610 | 11 | 21 46 29.32 | 1.9996 | 16 40 42.7 | 12.501 |
| 12 | 20 8 40.73 | 2.1637 | 24 43 49.3 | 7.732 | 12 | 21 48 29.20 | 1.9965 | 16 28 10.3 | 12.580 |
| 13 | 20 10 50.45 | 2.1604 | 24 36 1.7 | 7.852 | 13 | 21 50 28.90 | 1.9934 | 16 15 33.1 | 12.659 |
| 14 | 20 12 59.97 | 2.1571 | 24 28 7.0 | 7.972 | 14 | 21 52 28.41 | 1.9904 | 16 2 51.2 | 12.737 |
| 15 | 20 15 9.30 | 2.1537 | 24 20 5.1 | 8.092 | 15 | 21 54 27.75 | 1.9875 | 15 50 4.6 | 12.815 |
| 16 | 20 17 18.42 | 2.1503 | 24 11 56.0 | 8.210 | 16 | 21 56 26.91 | 1.9846 | 15 37 13.4 | 12.890 |
| 17 | 20 19 27.34 | 2.1469 | 24 3 39.9 | 8.328 | 17 | 21 58 25.90 | 1.9817 | 15 24 17.8 | 12.964 |
| 18 | 20 21 36.05 | 2.1435 | 23 55 16.7 | 8.445 | 18 | 22 0 24.72 | 1.9789 | 15 11 17.7 | 13.038 |
| 19 | 20 23 44.56 | 2.1401 | 23 46 46.5 | 8.561 | 19 | 22 2 23.37 | 1.9760 | 14 58 13.2 | 13.111 |
| 20 | 20 25 52.86 | 2.1366 | 23 38 9.4 | 8.677 | 20 | 22 4 21.84 | 1.9731 | 14 45 4.4 | 13.182 |
| 21 | 20 28 0.95 | 2.1330 | 23 29 25.3 | 8.792 | 21 | 22 6 20.14 | 1.9703 | 14 31 51.3 | 13.253 |
| 22 | 20 30 8.82 | 2.1294 | 23 20 34.4 | 8.905 | 22 | 22 8 18.28 | 1.9676 | 14 18 34.0 | 13.322 |
| 23 | 20 32 16.48 | 2.1258 | S. 23 11 36.7 | 9.018 | 23 | 22 10 16.26 | 1.9650 | S. 14 5 12.6 | 13.392 |
| | **WEDNESDAY 26.** | | | | | **FRIDAY 28.** | | | |
| 0 | 20 34 23.92 | 2.1222 | S. 23 2 32.2 | 9.131 | 0 | 22 12 14.08 | 1.9624 | S. 13 51 47.0 | 13.460 |
| 1 | 20 36 31.15 | 2.1187 | 22 53 21.0 | 9.242 | 1 | 22 14 11.75 | 1.9598 | 13 38 17.4 | 13.527 |
| 2 | 20 38 38.16 | 2.1151 | 22 44 3.2 | 9.352 | 2 | 22 16 9.26 | 1.9573 | 13 24 43.8 | 13.592 |
| 3 | 20 40 44.96 | 2.1115 | 22 34 38.7 | 9.462 | 3 | 22 18 6.63 | 1.9549 | 13 11 6.3 | 13.657 |
| 4 | 20 42 51.54 | 2.1079 | 22 25 7.7 | 9.571 | 4 | 22 20 3.85 | 1.9525 | 12 57 24.9 | 13.722 |
| 5 | 20 44 57.91 | 2.1044 | 22 15 30.2 | 9.679 | 5 | 22 22 0.93 | 1.9502 | 12 43 39.7 | 13.785 |
| 6 | 20 47 4.07 | 2.1008 | 22 5 46.2 | 9.787 | 6 | 22 23 57.88 | 1.9480 | 12 29 50.7 | 13.847 |
| 7 | 20 49 10.01 | 2.0972 | 21 55 55.8 | 9.893 | 7 | 22 25 54.69 | 1.9458 | 12 15 58.0 | 13.908 |
| 8 | 20 51 15.73 | 2.0935 | 21 45 59.1 | 9.998 | 8 | 22 27 51.37 | 1.9436 | 12 2 1.7 | 13.968 |
| 9 | 20 53 21.23 | 2.0897 | 21 35 56.1 | 10.103 | 9 | 22 29 47.92 | 1.9414 | 11 48 1.9 | 14.027 |
| 10 | 20 55 26.50 | 2.0860 | 21 25 46.8 | 10.207 | 10 | 22 31 44.34 | 1.9392 | 11 33 58.5 | 14.085 |
| 11 | 20 57 31.55 | 2.0824 | 21 15 31.3 | 10.309 | 11 | 22 33 40.63 | 1.9372 | 11 19 51.7 | 14.142 |
| 12 | 20 59 36.39 | 2.0788 | 21 5 9.7 | 10.411 | 12 | 22 35 36.81 | 1.9353 | 11 5 41.5 | 14.198 |
| 13 | 21 1 41.01 | 2.0752 | 20 54 42.0 | 10.512 | 13 | 22 37 32.87 | 1.9334 | 10 51 28.0 | 14.253 |
| 14 | 21 3 45.41 | 2.0716 | 20 44 8.3 | 10.612 | 14 | 22 39 28.82 | 1.9316 | 10 37 11.1 | 14.308 |
| 15 | 21 5 49.60 | 2.0681 | 20 33 28.5 | 10.712 | 15 | 22 41 24.67 | 1.9299 | 10 22 51.0 | 14.361 |
| 16 | 21 7 53.58 | 2.0645 | 20 22 42.8 | 10.810 | 16 | 22 43 20.41 | 1.9283 | 10 8 27.8 | 14.413 |
| 17 | 21 9 57.34 | 2.0609 | 20 11 51.3 | 10.907 | 17 | 22 45 16.06 | 1.9267 | 9 54 1.5 | 14.464 |
| 18 | 21 12 0.89 | 2.0573 | 20 0 53.9 | 11.004 | 18 | 22 47 11.61 | 1.9251 | 9 39 32.1 | 14.515 |
| 19 | 21 14 4.22 | 2.0537 | 19 49 50.8 | 11.099 | 19 | 22 49 7.07 | 1.9236 | 9 24 59.7 | 14.563 |
| 20 | 21 16 7.34 | 2.0502 | 19 38 42.0 | 11.194 | 20 | 22 51 2.44 | 1.9221 | 9 10 24.5 | 14.611 |
| 21 | 21 18 10.25 | 2.0467 | 19 27 27.5 | 11.288 | 21 | 22 52 57.72 | 1.9207 | 8 55 46.4 | 14.659 |
| 22 | 21 20 12.94 | 2.0431 | 19 16 7.4 | 11.381 | 22 | 22 54 52.92 | 1.9193 | 8 41 5.4 | 14.706 |
| 23 | 21 22 15.42 | 2.0395 | 19 4 41.8 | 11.472 | 23 | 22 56 48.04 | 1.9180 | 8 26 21.7 | 14.750 |
| 24 | 21 24 17.68 | 2.0360 | S. 18 53 10.7 | 11.563 | 24 | 22 58 43.08 | 1.9168 | S. 8 11 35.4 | 14.794 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SATURDAY 29.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 22 58 43.08 | 1.9168 | S. 8 11 35.4 | 14.794 |
| 1 | 23 0 38.06 | 1.9157 | 7 56 46.5 | 14.838 |
| 2 | 23 2 32.97 | 1.9147 | 7 41 54.9 | 14.881 |
| 3 | 23 4 27.82 | 1.9137 | 7 27 0.8 | 14.922 |
| 4 | 23 6 22.62 | 1.9129 | 7 12 4.3 | 14.962 |
| 5 | 23 8 17.37 | 1.9122 | 6 57 5.4 | 15.002 |
| 6 | 23 10 12.08 | 1.9115 | 6 42 4.1 | 15.041 |
| 7 | 23 12 6.75 | 1.9108 | 6 27 0.5 | 15.077 |
| 8 | 23 14 1.37 | 1.9101 | 6 11 54.8 | 15.113 |
| 9 | 23 15 55.96 | 1.9095 | 5 56 46.9 | 15.149 |
| 10 | 23 17 50.51 | 1.9089 | 5 41 36.9 | 15.183 |
| 11 | 23 19 45.03 | 1.9085 | 5 26 24.9 | 15.216 |
| 12 | 23 21 39.53 | 1.9082 | 5 11 11.0 | 15.248 |
| 13 | 23 23 34.01 | 1.9079 | 4 55 55.1 | 15.280 |
| 14 | 23 25 28.48 | 1.9078 | 4 40 37 4 | 15.310 |
| 15 | 23 27 22.94 | 1.9078 | 4 25 17.9 | 15.340 |
| 16 | 23 29 17.41 | 1.9079 | 4 9 56.6 | 15.368 |
| 17 | 23 31 11.89 | 1.9080 | 3 54 33.7 | 15.395 |
| 18 | 23 33 6.37 | 1.9081 | 3 39 9.2 | 15.421 |
| 19 | 23 35 0.86 | 1.9083 | 3 23 43.2 | 15.447 |
| 20 | 23 36 55.37 | 1.9086 | 3 8 15.6 | 15.472 |
| 21 | 23 38 49.89 | 1.9089 | 2 52 46.6 | 15.494 |
| 22 | 23 40 44.43 | 1.9092 | 2 37 16.3 | 15.516 |
| 23 | 23 42 39.00 | 1.9097 | S. 2 21 44.7 | 15.537 |

### SUNDAY 30.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 23 44 33.60 | 1.9103 | S. 2 6 11.8 | 15.558 |
| 1 | 23 46 28.24 | 1.9111 | 1 50 37.7 | 15.577 |
| 2 | 23 48 22.93 | 1.9119 | 1 35 2.6 | 15.594 |
| 3 | 23 50 17.67 | 1.9127 | 1 19 26.4 | 15.611 |
| 4 | 23 52 12.46 | 1.9137 | 1 3 49.2 | 15.627 |
| 5 | 23 54 7.32 | 1.9148 | 0 48 11.1 | 15.643 |
| 6 | 23 56 2.24 | 1.9159 | 0 32 32.1 | 15.657 |
| 7 | 23 57 57.23 | 1.9171 | 0 16 52.3 | 15.669 |
| 8 | 23 59 52.30 | 1.9184 | S. 0 1 11.8 | 15.681 |
| 9 | 0 1 47.44 | 1.9197 | N. 0 14 29.4 | 15.692 |
| 10 | 0 3 42.66 | 1.9211 | 0 30 11.2 | 15.701 |
| 11 | 0 5 37.97 | 1.9226 | 0 45 53.5 | 15.709 |
| 12 | 0 7 33.37 | 1.9242 | 1 1 36.3 | 15.717 |
| 13 | 0 9 28.87 | 1.9259 | 1 17 19.5 | 15.723 |
| 14 | 0 11 24.48 | 1.9277 | 1 33 3.1 | 15.729 |
| 15 | 0 13 20.20 | 1.9296 | 1 48 47.0 | 15.733 |
| 16 | 0 15 16.03 | 1.9316 | 2 4 31.1 | 15.736 |
| 17 | 0 17 11.99 | 1.9337 | 2 20 15.3 | 15.737 |
| 18 | 0 19 8.07 | 1.9358 | 2 35 59.6 | 15.738 |
| 19 | 0 21 4.28 | 1.9380 | 2 51 43.9 | 15.738 |
| 20 | 0 23 0.63 | 1.9403 | 3 7 28.1 | 15.737 |
| 21 | 0 24 57.12 | 1.9427 | 3 23 12.3 | 15.735 |
| 22 | 0 26 53.75 | 1.9451 | 3 38 56.3 | 15.731 |
| 23 | 0 28 50.53 | 1.9477 | 3 54 40.0 | 15.726 |
| 24 | 0 30 47.47 | 1.9503 | N. 4 10 23.4 | 15.720 |

### MONDAY 31.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 0 30 47.47 | 1.9503 | N. 4 10 23.4 | 15.720 |
| 1 | 0 32 44.57 | 1.9531 | 4 26 6.4 | 15.713 |
| 2 | 0 34 41.84 | 1.9560 | 4 41 49.0 | 15.705 |
| 3 | 0 36 39.29 | 1.9589 | 4 57 31.0 | 15.695 |
| 4 | 0 38 36.91 | 1.9619 | 5 13 12.4 | 15.684 |
| 5 | 0 40 34.72 | 1.9651 | 5 28 53.1 | 15.672 |
| 6 | 0 42 32.72 | 1.9683 | 5 44 33.1 | 15.660 |
| 7 | 0 44 30.91 | 1.9716 | 6 0 12.3 | 15.646 |
| 8 | 0 46 29.31 | 1.9750 | 6 15 50.6 | 15.630 |
| 9 | 0 48 27.91 | 1.9784 | 6 31 27.9 | 15.613 |
| 10 | 0 50 26.72 | 1.9818 | 6 47 4.2 | 15.596 |
| 11 | 0 52 25.73 | 1.9853 | 7 2 39.4 | 15.576 |
| 12 | 0 54 24.96 | 1.9891 | 7 18 13.3 | 15.555 |
| 13 | 0 56 24.42 | 1.9930 | 7 33 46.0 | 15.534 |
| 14 | 0 58 24.12 | 1.9970 | 7 49 17.4 | 15.512 |
| 15 | 1 0 24.06 | 2.0010 | 8 4 47.4 | 15.488 |
| 16 | 1 2 24.24 | 2.0051 | 8 20 15.9 | 15.462 |
| 17 | 1 4 24.67 | 2.0093 | 8 35 42.9 | 15.436 |
| 18 | 1 6 25.36 | 2.0136 | 8 51 8.2 | 15.408 |
| 19 | 1 8 26.31 | 2.0180 | 9 6 31.8 | 15.378 |
| 20 | 1 10 27.52 | 2.0224 | 9 21 53.6 | 15.347 |
| 21 | 1 12 29.00 | 2.0270 | 9 37 13.5 | 15.315 |
| 22 | 1 14 30.76 | 2.0316 | 9 52 31.4 | 15.283 |
| 23 | 1 16 32.79 | 2.0363 | N.10 7 47.4 | 15.249 |

### TUESDAY, FEBRUARY 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 1 18 35.11 | 2.0411 | N.10 23 1.3 | 15.213 |

### PHASES OF THE MOON.

| | d | h | m |
|---|---|---|---|
| ☽ First Quarter, . . | 4 | 3 | 24.2 |
| ○ Full Moon, . . . | 10 | 18 | 23.1 |
| ☾ Last Quarter, . . | 17 | 20 | 49.6 |
| ● New Moon, . . . | 26 | 1 | 41.7 |

| | d | h |
|---|---|---|
| ☾ Perigee, . . . . . | 9 | 15.7 |
| ☾ Apogee, . . . . . | 21 | 21.3 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun | W. | 52° 35′ 16″ | 3204 | 54° 1′ 20″ | 3194 | 55° 27′ 37″ | 3181 | 56° 54′ 9″ | 3169 |
| | Venus | W. | 27 57 27 | 3284 | 29 21 57 | 3271 | 30 46 42 | 3259 | 32 11 42 | 3246 |
| | α Arietis | E. | 63 51 3 | 2853 | 62 17 44 | 2845 | 60 44 14 | 2835 | 59 10 32 | 2827 |
| | Aldebaran | E. | 94 46 1 | 2878 | 93 13 14 | 2867 | 91 40 13 | 2857 | 90 6 59 | 2846 |
| 2 | Sun | W. | 64 10 30 | 3105 | 65 38 33 | 3092 | 67 6 52 | 3079 | 68 35 27 | 3065 |
| | Venus | W. | 39 20 32 | 3179 | 40 47 6 | 3165 | 42 13 57 | 3152 | 43 41 4 | 3137 |
| | Saturn | W. | 22 22 22 | 2773 | 23 57 25 | 2760 | 25 32 46 | 2746 | 27 8 25 | 2733 |
| | α Arietis | E. | 51 19 9 | 2782 | 49 44 17 | 2772 | 48 9 13 | 2764 | 46 33 58 | 2755 |
| | Aldebaran | E. | 82 17 23 | 2793 | 80 42 46 | 2782 | 79 7 54 | 2771 | 77 32 48 | 2759 |
| 3 | Sun | W. | 76 2 42 | 2993 | 77 33 3 | 2978 | 79 3 43 | 2963 | 80 34 42 | 2948 |
| | Venus | W. | 51 1 4 | 3063 | 52 29 59 | 3048 | 53 59 12 | 3033 | 55 28 44 | 3017 |
| | Saturn | W. | 35 11 8 | 2663 | 36 48 37 | 2650 | 38 26 24 | 2635 | 40 4 31 | 2621 |
| | α Arietis | E. | 38 34 54 | 2716 | 36 58 35 | 2709 | 35 22 7 | 2704 | 33 45 32 | 2699 |
| | Aldebaran | E. | 69 33 27 | 2701 | 67 56 48 | 2689 | 66 19 54 | 2678 | 64 42 44 | 2666 |
| | Pollux | E. | 112 49 27 | 2626 | 111 11 8 | 2612 | 109 32 30 | 2599 | 107 53 33 | 2585 |
| 4 | Sun | W. | 88 14 31 | 2869 | 89 47 30 | 2853 | 91 20 49 | 2836 | 92 54 30 | 2820 |
| | Venus | W. | 63 1 25 | 2935 | 64 32 59 | 2919 | 66 4 54 | 2901 | 67 37 11 | 2885 |
| | Saturn | W. | 48 20 5 | 2547 | 50 0 13 | 2531 | 51 40 43 | 2516 | 53 21 34 | 2500 |
| | Fomalhaut | W. | 44 32 1 | 2993 | 46 2 23 | 2951 | 47 33 37 | 2912 | 49 5 40 | 2875 |
| | Aldebaran | E. | 56 32 59 | 2609 | 54 54 16 | 2598 | 53 15 18 | 2588 | 51 36 6 | 2577 |
| | Pollux | E. | 99 33 55 | 2512 | 97 52 59 | 2497 | 96 11 41 | 2482 | 94 30 2 | 2467 |
| 5 | Sun | W. | 100 48 16 | 2738 | 102 24 6 | 2720 | 104 0 19 | 2704 | 105 36 54 | 2687 |
| | Venus | W. | 75 24 1 | 2800 | 76 58 29 | 2782 | 78 33 20 | 2765 | 80 8 34 | 2748 |
| | Saturn | W. | 61 51 16 | 2422 | 63 34 19 | 2407 | 65 17 44 | 2391 | 67 1 31 | 2375 |
| | Fomalhaut | W. | 56 57 5 | 2716 | 58 33 23 | 2689 | 60 10 17 | 2663 | 61 47 46 | 2638 |
| | α Pegasi | W. | 37 13 2 | 3218 | 38 38 50 | 3142 | 40 6 9 | 3073 | 41 34 52 | 3009 |
| | Mars | W. | 33 34 38 | 2620 | 35 13 6 | 2603 | 36 51 57 | 2587 | 38 31 10 | 2571 |
| | Pollux | E. | 85 56 24 | 2390 | 84 12 35 | 2374 | 82 28 23 | 2359 | 80 43 49 | 2343 |
| 6 | Sun | W. | 113 45 17 | 2607 | 115 24 3 | 2591 | 117 3 10 | 2576 | 118 42 38 | 2561 |
| | Venus | W. | 88 10 20 | 2664 | 89 47 48 | 2647 | 91 25 39 | 2631 | 93 3 52 | 2615 |
| | Saturn | W. | 75 46 5 | 2298 | 77 32 7 | 2283 | 79 18 31 | 2269 | 81 5 16 | 2254 |
| | Fomalhaut | W. | 70 3 25 | 2525 | 71 44 4 | 2504 | 73 25 11 | 2485 | 75 6 45 | 2467 |
| | α Pegasi | W. | 49 16 19 | 2760 | 50 51 39 | 2721 | 52 27 51 | 2684 | 54 4 52 | 2650 |
| | Mars | W. | 46 52 50 | 2490 | 48 34 17 | 2475 | 50 16 6 | 2459 | 51 58 17 | 2443 |
| | Pollux | E. | 71 55 22 | 2267 | 70 8 34 | 2253 | 68 21 25 | 2238 | 66 33 54 | 2223 |
| | Regulus | E. | 108 41 16 | 2269 | 106 54 31 | 2253 | 105 7 23 | 2239 | 103 19 53 | 2225 |
| 7 | Venus | W. | 101 20 11 | 2541 | 103 0 27 | 2527 | 104 41 3 | 2513 | 106 21 58 | 2501 |
| | Saturn | W. | 90 4 18 | 2185 | 91 53 8 | 2172 | 93 42 17 | 2161 | 95 31 44 | 2149 |
| | Fomalhaut | W. | 83 40 47 | 2385 | 85 24 43 | 2372 | 87 8 58 | 2359 | 88 53 32 | 2347 |
| | α Pegasi | W. | 62 20 44 | 2507 | 64 1 48 | 2484 | 65 43 24 | 2461 | 67 25 32 | 2441 |
| | Mars | W. | 60 34 30 | 2372 | 62 18 45 | 2359 | 64 3 19 | 2346 | 65 48 12 | 2333 |
| | Pollux | E. | 57 31 4 | 2156 | 55 41 30 | 2143 | 53 51 37 | 2131 | 52 1 25 | 2120 |
| | Regulus | E. | 94 17 8 | 2156 | 92 27 34 | 2143 | 90 37 41 | 2132 | 88 47 30 | 2119 |
| 8 | Venus | W. | 114 50 47 | 2444 | 116 33 19 | 2434 | 118 16 5 | 2425 | 119 59 4 | 2417 |
| | Saturn | W. | 104 43 15 | 2097 | 106 34 19 | 2088 | 108 25 37 | 2080 | 110 17 7 | 2072 |
| | Fomalhaut | W. | 97 40 17 | 2300 | 99 26 16 | 2294 | 101 12 24 | 2289 | 102 58 39 | 2285 |
| | α Pegasi | W. | 76 2 54 | 2357 | 77 47 31 | 2344 | 79 32 26 | 2333 | 81 17 38 | 2322 |
| | Mars | W. | 74 36 54 | 2279 | 76 23 24 | 2269 | 78 10 9 | 2260 | 79 57 7 | 2253 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun | W. | 58° 20′ 55″ | 3157 | 59° 47′ 56″ | 3144 | 61° 15′ 12″ | 3132 | 62° 42′ 43″ | 3119 |
| | Venus | W. | 33 36 57 | 3233 | 35 2 27 | 3220 | 36 28 13 | 3207 | 37 54 14 | 3193 |
| | α Arietis | E. | 57 36 39 | 2818 | 56 2 34 | 2809 | 54 28 18 | 2799 | 52 53 49 | 2791 |
| | Aldebaran | E. | 88 33 31 | 2836 | 86 59 50 | 2825 | 85 25 55 | 2815 | 83 51 46 | 2804 |
| 2 | Sun | W. | 70 4 19 | 3052 | 71 33 28 | 3037 | 73 2 55 | 3023 | 74 32 39 | 3008 |
| | Venus | W. | 45 8 29 | 3123 | 46 36 11 | 3109 | 48 4 10 | 3093 | 49 32 28 | 3078 |
| | Saturn | W. | 28 44 21 | 2719 | 30 20 35 | 2705 | 31 57 8 | 2692 | 33 33 59 | 2678 |
| | α Arietis | E. | 44 58 31 | 2747 | 43 22 53 | 2738 | 41 47 4 | 2730 | 40 11 4 | 2722 |
| | Aldebaran | E. | 75 57 26 | 2747 | 74 21 49 | 2736 | 72 45 57 | 2725 | 71 9 50 | 2713 |
| 3 | Sun | W. | 82 6 0 | 2932 | 83 37 38 | 2917 | 85 9 35 | 2901 | 86 41 53 | 2885 |
| | Venus | W. | 56 58 36 | 3001 | 58 28 48 | 2985 | 59 59 20 | 2969 | 61 30 12 | 2952 |
| | Saturn | W. | 41 42 57 | 2607 | 43 21 43 | 2591 | 45 0 50 | 2577 | 46 40 17 | 2561 |
| | α Arietis | E. | 32 8 51 | 2695 | 30 32 5 | 2695 | 28 55 18 | 2696 | 27 18 33 | 2703 |
| | Aldebaran | E. | 63 5 18 | 2655 | 61 27 37 | 2643 | 59 49 40 | 2631 | 58 11 27 | 2620 |
| | Pollux | E. | 106 14 17 | 2570 | 104 34 41 | 2556 | 102 54 46 | 2542 | 101 14 31 | 2527 |
| 4 | Sun | W. | 94 28 32 | 2804 | 96 2 55 | 2787 | 97 37 40 | 2770 | 99 12 47 | 2753 |
| | Venus | W. | 69 9 49 | 2868 | 70 42 49 | 2851 | 72 16 11 | 2834 | 73 49 55 | 2817 |
| | Saturn | W. | 55 2 47 | 2485 | 56 44 21 | 2470 | 58 26 17 | 2454 | 60 8 35 | 2438 |
| | Fomalhaut | W. | 50 38 31 | 2840 | 52 12 7 | 2807 | 53 46 26 | 2775 | 55 21 26 | 2746 |
| | Aldebaran | E. | 49 56 40 | 2568 | 48 17 1 | 2559 | 46 37 10 | 2551 | 44 57 8 | 2544 |
| | Pollux | E. | 92 48 2 | 2451 | 91 5 40 | 2436 | 89 22 57 | 2421 | 87 39 52 | 2405 |
| 5 | Sun | W. | 107 13 51 | 2671 | 108 51 10 | 2655 | 110 28 50 | 2638 | 112 6 53 | 2623 |
| | Venus | W. | 81 44 10 | 2731 | 83 20 9 | 2714 | 84 56 30 | 2697 | 86 33 14 | 2681 |
| | Saturn | W. | 68 45 41 | 2360 | 70 30 13 | 2344 | 72 15 8 | 2329 | 74 0 25 | 2313 |
| | Fomalhaut | W. | 63 25 50 | 2613 | 65 4 27 | 2590 | 66 43 36 | 2567 | 68 23 16 | 2546 |
| | α Pegasi | W. | 43 4 54 | 2951 | 44 36 8 | 2898 | 46 8 30 | 2848 | 47 41 55 | 2803 |
| | Mars | W. | 40 10 45 | 2554 | 41 50 43 | 2538 | 43 31 3 | 2522 | 45 11 45 | 2506 |
| | Pollux | E. | 78 58 52 | 2328 | 77 13 33 | 2313 | 75 27 52 | 2297 | 73 41 48 | 2282 |
| 6 | Sun | W. | 120 22 26 | 2546 | 122 2 35 | 2533 | 123 43 3 | 2518 | 125 23 51 | 2505 |
| | Venus | W. | 94 42 26 | 2600 | 96 21 21 | 2585 | 98 0 37 | 2569 | 99 40 14 | 2555 |
| | Saturn | W. | 82 52 23 | 2240 | 84 39 51 | 2226 | 86 27 40 | 2212 | 88 15 49 | 2199 |
| | Fomalhaut | W. | 76 48 45 | 2448 | 78 31 11 | 2432 | 80 14 0 | 2416 | 81 57 12 | 2400 |
| | α Pegasi | W. | 55 42 39 | 2618 | 57 21 10 | 2587 | 59 0 23 | 2559 | 60 40 15 | 2532 |
| | Mars | W. | 53 40 50 | 2429 | 55 23 44 | 2414 | 57 6 59 | 2400 | 58 50 34 | 2385 |
| | Pollux | E. | 64 46 1 | 2209 | 62 57 47 | 2196 | 61 9 13 | 2182 | 59 20 18 | 2169 |
| | Regulus | E. | 101 32 2 | 2210 | 99 43 49 | 2196 | 97 55 16 | 2182 | 96 6 22 | 2169 |
| 7 | Venus | W. | 108 3 10 | 2489 | 109 44 39 | 2476 | 111 26 26 | 2465 | 113 8 29 | 2454 |
| | Saturn | W. | 97 21 29 | 2137 | 99 11 31 | 2126 | 101 1 50 | 2116 | 102 52 25 | 2106 |
| | Fomalhaut | W. | 90 38 23 | 2335 | 92 23 31 | 2326 | 94 8 53 | 2316 | 95 54 29 | 2308 |
| | α Pegasi | W. | 69 8 9 | 2421 | 70 51 14 | 2403 | 72 34 44 | 2387 | 74 18 38 | 2371 |
| | Mars | W. | 67 33 23 | 2321 | 69 18 52 | 2310 | 71 4 37 | 2299 | 72 50 38 | 2289 |
| | Pollux | E. | 50 10 56 | 2109 | 48 20 10 | 2098 | 46 29 7 | 2088 | 44 37 49 | 2078 |
| | Regulus | E. | 86 57 0 | 2108 | 85 6 13 | 2097 | 83 15 9 | 2087 | 81 23 50 | 2077 |
| 8 | Venus | W. | 121 42 14 | 2410 | 123 25 35 | 2403 | 125 9 6 | 2396 | 126 52 46 | 2391 |
| | Saturn | W. | 112 8 49 | 2065 | 114 0 42 | 2059 | 115 52 45 | 2053 | 117 44 56 | 2048 |
| | Fomalhaut | W. | 104 45 0 | 2283 | 106 31 24 | 2281 | 108 17 51 | 2281 | 110 4 18 | 2283 |
| | α Pegasi | W. | 83 3 6 | 2312 | 84 48 48 | 2304 | 86 34 41 | 2298 | 88 20 44 | 2291 |
| | Mars | W. | 81 44 16 | 2245 | 83 31 36 | 2239 | 85 19 6 | 2233 | 87 6 45 | 2227 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | III$^h$. | P. L. of Diff. | VI$^h$. | P. L. of Diff. | IX$^h$. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | α Arietis | W. | 32° 47′ 52″ | 2176 | 34° 36′ 55″ | 2157 | 36° 26′ 27″ | 2140 | 38° 16′ 25″ | 2125 |
| | Pollux | E. | 42 46 16 | 2069 | 40 54 29 | 2061 | 39 2 30 | 2053 | 37 10 18 | 2046 |
| | Regulus | E. | 79 32 15 | 2068 | 77 40 26 | 2059 | 75 48 23 | 2051 | 73 56 8 | 2043 |
| 9 | α Pegasi | W. | 90 6 56 | 2287 | 91 53 14 | 2285 | 93 39 36 | 2283 | 95 26 1 | 2282 |
| | Mars | W. | 88 54 32 | 2223 | 90 42 26 | 2219 | 92 30 25 | 2216 | 94 18 29 | 2213 |
| | α Arietis | W. | 47 31 14 | 2072 | 49 22 57 | 2064 | 51 14 51 | 2059 | 53 6 54 | 2053 |
| | Regulus | E. | 64 32 15 | 2015 | 62 39 4 | 2012 | 60 45 48 | 2009 | 58 52 28 | 2007 |
| | Spica | E. | 118 32 38 | 2010 | 116 39 20 | 2007 | 114 45 57 | 2004 | 112 52 29 | 2002 |
| 10 | Mars | W. | 103 19 18 | 2214 | 105 7 25 | 2216 | 106 55 29 | 2219 | 108 43 28 | 2223 |
| | α Arietis | W. | 62 28 31 | 2044 | 64 20 56 | 2045 | 66 13 20 | 2047 | 68 5 41 | 2050 |
| | Aldebaran | W. | 32 26 59 | 2233 | 34 14 37 | 2214 | 36 2 43 | 2199 | 37 51 12 | 2187 |
| | Regulus | E. | 49 25 22 | 2009 | 47 32 1 | 2011 | 45 38 44 | 2015 | 43 45 33 | 2019 |
| | Spica | E. | 103 24 42 | 2002 | 101 31 11 | 2005 | 99 37 44 | 2008 | 97 44 22 | 2011 |
| 11 | α Arietis | W. | 77 25 54 | 2077 | 79 17 29 | 2084 | 81 8 53 | 2092 | 83 0 4 | 2102 |
| | Aldebaran | W. | 46 56 44 | 2165 | 48 46 4 | 2167 | 50 35 21 | 2170 | 52 24 34 | 2174 |
| | Regulus | E. | 34 21 44 | 2053 | 32 29 33 | 2062 | 30 37 36 | 2073 | 28 45 55 | 2085 |
| | Spica | E. | 88 19 21 | 2041 | 86 26 51 | 2050 | 84 34 34 | 2059 | 82 42 31 | 2068 |
| | Jupiter | E. | 121 40 16 | 2113 | 119 49 36 | 2120 | 117 59 7 | 2128 | 116 8 51 | 2137 |
| 12 | α Arietis | W. | 92 12 2 | 2159 | 94 1 32 | 2172 | 95 50 41 | 2186 | 97 39 29 | 2201 |
| | Aldebaran | W. | 61 28 30 | 2212 | 63 16 40 | 2223 | 65 4 34 | 2234 | 66 52 11 | 2246 |
| | Pollux | W. | 17 29 33 | 2151 | 19 19 15 | 2160 | 21 8 43 | 2170 | 22 57 55 | 2182 |
| | Spica | E. | 73 26 17 | 2126 | 71 35 57 | 2139 | 69 45 57 | 2153 | 67 56 18 | 2167 |
| | Jupiter | E. | 107 1 18 | 2193 | 105 12 40 | 2206 | 103 24 21 | 2220 | 101 36 23 | 2234 |
| | Antares | E. | 119 20 13 | 2126 | 117 29 53 | 2139 | 115 39 53 | 2153 | 113 50 14 | 2167 |
| 13 | Aldebaran | W. | 75 45 26 | 2317 | 77 31 1 | 2333 | 79 16 12 | 2350 | 81 0 59 | 2366 |
| | Pollux | W. | 31 59 4 | 2253 | 33 46 12 | 2270 | 35 32 55 | 2287 | 37 19 14 | 2304 |
| | Spica | E. | 58 53 40 | 2245 | 57 6 20 | 2263 | 55 19 26 | 2280 | 53 32 57 | 2297 |
| | Jupiter | E. | 92 42 4 | 2313 | 90 56 23 | 2330 | 89 11 7 | 2347 | 87 26 16 | 2365 |
| | Antares | E. | 104 47 36 | 2245 | 103 0 16 | 2263 | 101 13 22 | 2280 | 99 26 53 | 2297 |
| 14 | Aldebaran | W. | 89 38 40 | 2457 | 91 20 54 | 2475 | 93 2 42 | 2494 | 94 44 3 | 2515 |
| | Pollux | W. | 46 4 26 | 2394 | 47 48 10 | 2412 | 49 31 28 | 2431 | 51 14 19 | 2449 |
| | Spica | E. | 44 47 3 | 2389 | 43 3 12 | 2408 | 41 19 48 | 2426 | 39 36 51 | 2445 |
| | Jupiter | E. | 78 48 34 | 2458 | 77 6 22 | 2477 | 75 24 37 | 2497 | 73 43 19 | 2516 |
| | Antares | E. | 90 40 58 | 2389 | 88 57 7 | 2408 | 87 13 43 | 2426 | 85 30 46 | 2445 |
| | Sun | E. | 136 11 1 | 2752 | 134 35 30 | 2770 | 133 0 23 | 2789 | 131 25 41 | 2808 |
| 15 | Aldebaran | W. | 103 3 58 | 2613 | 104 42 35 | 2633 | 106 20 45 | 2653 | 107 58 28 | 2674 |
| | Pollux | W. | 59 41 57 | 2544 | 61 22 9 | 2563 | 63 1 55 | 2581 | 64 41 16 | 2600 |
| | Regulus | W. | 22 59 30 | 2563 | 24 39 16 | 2579 | 26 18 40 | 2596 | 27 57 41 | 2612 |
| | Jupiter | E. | 65 23 37 | 2615 | 63 45 2 | 2634 | 62 6 53 | 2654 | 60 29 11 | 2674 |
| | Antares | E. | 77 2 44 | 2540 | 75 22 27 | 2560 | 73 42 37 | 2578 | 72 3 12 | 2597 |
| | Sun | E. | 123 38 30 | 2906 | 122 6 19 | 2927 | 120 34 34 | 2946 | 119 3 14 | 2965 |
| 16 | Aldebaran | W. | 116 0 17 | 2774 | 117 35 19 | 2795 | 119 9 54 | 2814 | 120 44 4 | 2835 |
| | Pollux | W. | 72 51 43 | 2690 | 74 28 36 | 2708 | 76 5 5 | 2725 | 77 41 11 | 2742 |
| | Regulus | W. | 36 6 59 | 2698 | 37 43 42 | 2715 | 39 20 2 | 2732 | 40 56 0 | 2748 |
| | Jupiter | E. | 52 27 15 | 2771 | 50 52 9 | 2789 | 49 17 27 | 2808 | 47 43 10 | 2827 |
| | Antares | E. | 63 52 27 | 2688 | 62 15 31 | 2706 | 60 38 59 | 2722 | 59 2 49 | 2740 |
| | Sun | E. | 111 32 37 | 3062 | 110 3 41 | 3081 | 108 35 8 | 3099 | 107 6 57 | 3117 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XV$^{h}$. | P. L. of Diff. | XVIII$^{h}$. | P. L. of Diff. | XXI$^{h}$. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | α Arietis | W. | 40° 6′ 46″ | 2112 | 41° 57′ 27″ | 2099 | 43° 48′ 27″ | 2089 | 45° 39′ 43″ | 2079 |
| | Pollux | E. | 35 17 56 | 2040 | 33 25 24 | 2034 | 31 32 43 | 2030 | 29 39 55 | 2026 |
| | Regulus | E. | 72 3 41 | 2036 | 70 11 3 | 2030 | 68 18 16 | 2024 | 66 25 19 | 2019 |
| 9 | α Pegasi | W. | 97 12 27 | 2283 | 98 58 52 | 2285 | 100 45 13 | 2289 | 102 31 29 | 2294 |
| | Mars | W. | 96 6 37 | 2212 | 97 54 47 | 2211 | 99 42 58 | 2211 | 101 31 9 | 2212 |
| | α Arietis | W. | 54 59 5 | 2050 | 56 51 22 | 2048 | 58 43 42 | 2045 | 60 36 6 | 2044 |
| | Regulus | E. | 56 59 4 | 2005 | 55 5 38 | 2005 | 53 12 12 | 2005 | 51 18 46 | 2007 |
| | Spica | E. | 110 58 58 | 2001 | 109 5 25 | 2000 | 107 11 50 | 2000 | 105 18 15 | 2001 |
| 10 | Mars | W. | 110 31 21 | 2228 | 112 19 7 | 2234 | 114 6 44 | 2240 | 115 54 12 | 2247 |
| | α Arietis | W. | 69 57 57 | 2053 | 71 50 8 | 2058 | 73 42 12 | 2063 | 75 34 8 | 2070 |
| | Aldebaran | W. | 39 39 59 | 2178 | 41 28 59 | 2172 | 43 18 9 | 2168 | 45 7 25 | 2166 |
| | Regulus | E. | 41 52 28 | 2025 | 39 59 32 | 2030 | 38 6 45 | 2037 | 36 14 9 | 2044 |
| | Spica | E. | 95 51 5 | 2016 | 93 57 55 | 2021 | 92 4 54 | 2027 | 90 12 2 | 2034 |
| 11 | α Arietis | W. | 84 51 0 | 2112 | 86 41 41 | 2122 | 88 32 6 | 2134 | 90 22 13 | 2146 |
| | Aldebaran | W. | 54 13 41 | 2179 | 56 2 40 | 2186 | 57 51 29 | 2194 | 59 40 6 | 2202 |
| | Regulus | E. | 26 54 32 | 2096 | 25 3 27 | 2111 | 23 12 44 | 2126 | 21 22 24 | 2142 |
| | Spica | E. | 80 50 43 | 2079 | 78 59 11 | 2089 | 77 7 55 | 2101 | 75 16 57 | 2113 |
| | Jupiter | E. | 114 18 49 | 2147 | 112 29 2 | 2157 | 110 39 30 | 2169 | 108 50 15 | 2180 |
| 12 | α Arietis | W. | 99 27 55 | 2216 | 101 15 58 | 2232 | 103 3 38 | 2248 | 104 50 54 | 2265 |
| | Aldebaran | W. | 68 39 30 | 2259 | 70 26 30 | 2272 | 72 13 10 | 2287 | 73 59 29 | 2302 |
| | Pollux | W. | 24 46 50 | 2195 | 26 35 25 | 2208 | 28 23 40 | 2223 | 30 11 33 | 2238 |
| | Spica | E. | 66 7 0 | 2182 | 64 18 5 | 2197 | 62 29 33 | 2212 | 60 41 24 | 2229 |
| | Jupiter | E. | 99 48 46 | 2249 | 98 1 31 | 2264 | 96 14 39 | 2280 | 94 28 10 | 2296 |
| | Antares | E. | 112 0 56 | 2182 | 110 12 1 | 2197 | 108 23 29 | 2212 | 106 35 20 | 2229 |
| 13 | Aldebaran | W. | 82 45 22 | 2384 | 84 29 20 | 2401 | 86 12 53 | 2419 | 87 56 0 | 2438 |
| | Pollux | W. | 39 5 7 | 2322 | 40 50 35 | 2339 | 42 35 38 | 2357 | 44 20 15 | 2375 |
| | Spica | E. | 51 46 53 | 2315 | 50 1 16 | 2333 | 48 16 5 | 2352 | 46 31 21 | 2370 |
| | Jupiter | E. | 85 41 51 | 2383 | 83 57 52 | 2401 | 82 14 19 | 2420 | 80 31 13 | 2439 |
| | Antares | E. | 97 40 49 | 2315 | 95 55 11 | 2333 | 94 10 0 | 2352 | 92 25 16 | 2370 |
| 14 | Aldebaran | W. | 96 24 56 | 2533 | 98 5 23 | 2553 | 99 45 22 | 2573 | 101 24 54 | 2593 |
| | Pollux | W. | 52 56 44 | 2468 | 54 38 42 | 2487 | 56 20 13 | 2506 | 58 1 18 | 2525 |
| | Spica | E. | 37 54 21 | 2465 | 36 12 18 | 2484 | 34 30 42 | 2503 | 32 49 33 | 2522 |
| | Jupiter | E. | 72 2 28 | 2535 | 70 22 4 | 2556 | 68 42 8 | 2575 | 67 2 39 | 2595 |
| | Antares | E. | 83 48 16 | 2465 | 82 6 13 | 2484 | 80 24 37 | 2502 | 78 43 27 | 2522 |
| | Sun | E. | 129 51 24 | 2828 | 128 17 32 | 2848 | 126 44 6 | 2867 | 125 11 5 | 2887 |
| 15 | Aldebaran | W. | 109 35 43 | 2694 | 111 12 31 | 2713 | 112 48 53 | 2734 | 114 24 48 | 2753 |
| | Pollux | W. | 66 20 11 | 2618 | 67 58 41 | 2637 | 69 36 46 | 2655 | 71 14 27 | 2673 |
| | Regulus | W. | 29 36 19 | 2629 | 31 14 34 | 2646 | 32 52 26 | 2664 | 34 29 54 | 2681 |
| | Jupiter | E. | 58 51 56 | 2693 | 57 15 7 | 2713 | 55 38 44 | 2732 | 54 2 47 | 2751 |
| | Antares | E. | 70 24 13 | 2616 | 68 45 40 | 2634 | 67 7 31 | 2652 | 65 29 47 | 2670 |
| | Sun | E. | 117 32 18 | 2985 | 116 1 47 | 3005 | 114 31 40 | 3024 | 113 1 57 | 3043 |
| 16 | Aldebaran | W. | 122 17 47 | 2855 | 123 51 4 | 2874 | 125 23 56 | 2894 | 126 56 22 | 2915 |
| | Pollux | W. | 79 16 55 | 2759 | 80 52 17 | 2775 | 82 27 17 | 2792 | 84 1 56 | 2808 |
| | Regulus | W. | 42 31 36 | 2764 | 44 6 51 | 2780 | 45 41 45 | 2796 | 47 16 18 | 2811 |
| | Jupiter | E. | 46 9 17 | 2845 | 44 35 48 | 2864 | 43 2 43 | 2883 | 41 30 2 | 2901 |
| | Antares | E. | 57 27 2 | 2756 | 55 51 37 | 2772 | 54 16 33 | 2789 | 52 41 51 | 2805 |
| | Sun | E. | 105 39 8 | 3135 | 104 11 41 | 3153 | 102 44 35 | 3169 | 101 17 49 | 3187 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Pollux | W. | 85° 36′ 14″ | 2822 | 87° 10′ 13″ | 2838 | 88° 43′ 52″ | 2852 | 90° 17′ 13″ | 2866 |
| | Regulus | W. | 48 50 32 | 2826 | 50 24 26 | 2841 | 51 58 1 | 2855 | 53 31 18 | 2869 |
| | Jupiter | E. | 39 57 44 | 2919 | 38 25 49 | 2938 | 36 54 18 | 2955 | 35 23 9 | 2974 |
| | Antares | E. | 51 7 29 | 2820 | 49 33 27 | 2835 | 47 59 44 | 2849 | 46 26 20 | 2864 |
| | Sun | E. | 99 51 24 | 3203 | 98 25 18 | 3220 | 96 59 32 | 3235 | 95 34 4 | 3250 |
| 18 | Pollux | W. | 97 59 34 | 2931 | 99 31 14 | 2942 | 101 2 39 | 2954 | 102 33 50 | 2965 |
| | Regulus | W. | 61 13 23 | 2933 | 62 45 0 | 2944 | 64 16 23 | 2956 | 65 47 31 | 2966 |
| | Antares | E. | 38 43 45 | 2928 | 37 12 2 | 2940 | 35 40 34 | 2951 | 34 9 20 | 2962 |
| | Sun | E. | 88 31 4 | 3320 | 87 7 16 | 3333 | 85 43 43 | 3345 | 84 20 24 | 3357 |
| 19 | Pollux | W. | 110 6 32 | 3011 | 111 36 31 | 3020 | 113 6 19 | 3027 | 114 35 58 | 3034 |
| | Regulus | W. | 73 20 4 | 3013 | 74 50 1 | 3021 | 76 19 48 | 3028 | 77 49 26 | 3035 |
| | Spica | W. | 19 17 41 | 3009 | 20 47 43 | 3018 | 22 17 34 | 3025 | 23 47 16 | 3032 |
| | Antares | E. | 26 36 21 | 3009 | 25 6 20 | 3017 | 23 36 28 | 3025 | 22 6 46 | 3031 |
| | Sun | E. | 77 26 58 | 3409 | 76 4 52 | 3417 | 74 42 55 | 3426 | 73 21 8 | 3433 |
| 20 | Regulus | W. | 85 15 35 | 3064 | 86 44 29 | 3068 | 88 13 18 | 3072 | 89 42 2 | 3076 |
| | Spica | W. | 31 13 46 | 3060 | 32 42 44 | 3065 | 34 11 37 | 3069 | 35 40 25 | 3072 |
| | Sun | E. | 66 34 12 | 3466 | 65 13 10 | 3471 | 63 52 13 | 3475 | 62 31 21 | 3480 |
| 21 | Regulus | W. | 97 4 46 | 3087 | 98 33 12 | 3088 | 100 1 36 | 3088 | 101 30 0 | 3088 |
| | Spica | W. | 43 3 32 | 3083 | 44 32 2 | 3084 | 46 0 31 | 3085 | 47 28 59 | 3085 |
| | Sun | E. | 55 48 2 | 3494 | 54 27 31 | 3495 | 53 7 1 | 3497 | 51 46 33 | 3497 |
| 22 | Regulus | W. | 108 52 4 | 3085 | 110 20 32 | 3082 | 111 49 3 | 3081 | 113 17 36 | 3078 |
| | Spica | W. | 54 51 25 | 3081 | 56 19 58 | 3079 | 57 48 33 | 3077 | 59 17 11 | 3074 |
| | Sun | E. | 45 4 20 | 3497 | 43 43 53 | 3496 | 42 23 24 | 3495 | 41 2 54 | 3493 |
| 23 | Spica | W. | 66 41 15 | 3057 | 68 10 17 | 3053 | 69 39 24 | 3048 | 71 8 37 | 3044 |
| | Antares | W. | 20 47 19 | 3057 | 22 16 21 | 3053 | 23 45 28 | 3049 | 25 14 40 | 3044 |
| | Sun | E. | 34 19 57 | 3485 | 32 59 16 | 3483 | 31 38 33 | 3481 | 30 17 48 | 3480 |
| 24 | Antares | W. | 32 42 14 | 3018 | 34 12 5 | 3012 | 35 42 3 | 3005 | 37 12 9 | 3000 |
| 28 | Sun | W. | 22 12 27 | 3221 | 23 38 11 | 3204 | 25 4 16 | 3188 | 26 30 40 | 3173 |
| | α Arietis | E. | 66 47 4 | 2821 | 65 13 3 | 2813 | 63 38 52 | 2806 | 62 4 32 | 2799 |
| | Aldebaran | E. | 97 43 45 | 2852 | 96 10 24 | 2844 | 94 36 53 | 2835 | 93 3 11 | 2827 |
| 29 | Sun | W. | 33 46 47 | 3109 | 35 14 46 | 3096 | 36 43 0 | 3086 | 38 11 27 | 3073 |
| | α Arietis | E. | 54 10 36 | 2766 | 52 35 23 | 2759 | 51 0 1 | 2753 | 49 24 31 | 2747 |
| | Aldebaran | E. | 85 11 57 | 2785 | 83 37 10 | 2778 | 82 2 13 | 2769 | 80 27 5 | 2763 |
| | Pollux | E. | 128 40 21 | 2719 | 127 4 7 | 2711 | 125 27 42 | 2702 | 123 51 5 | 2693 |
| 30 | Sun | W. | 45 37 12 | 3019 | 47 7 1 | 3008 | 48 37 4 | 2997 | 50 7 20 | 2987 |
| | Venus | W. | 14 39 40 | 3076 | 16 8 19 | 3067 | 17 37 9 | 3056 | 19 6 12 | 3047 |
| | α Arietis | E. | 41 25 12 | 2722 | 39 49 1 | 2719 | 38 12 46 | 2716 | 36 36 27 | 2713 |
| | Aldebaran | E. | 72 28 53 | 2723 | 70 52 44 | 2716 | 69 16 26 | 2709 | 67 39 58 | 2701 |
| | Pollux | E. | 115 45 2 | 2649 | 114 7 14 | 2640 | 112 29 13 | 2631 | 110 51 0 | 2622 |
| 31 | Sun | W. | 57 42 0 | 2933 | 59 13 37 | 2923 | 60 45 27 | 2912 | 62 17 31 | 2901 |
| | Venus | W. | 26 34 37 | 2994 | 28 4 57 | 2984 | 29 35 30 | 2973 | 31 6 16 | 2963 |
| | α Pegasi | W. | 24 57 53 | 4780 | 25 57 46 | 4510 | 27 1 29 | 4285 | 28 8 35 | 4095 |
| | Aldebaran | E. | 59 35 19 | 2669 | 57 57 58 | 2663 | 56 20 28 | 2657 | 54 42 51 | 2652 |
| | Pollux | E. | 102 36 48 | 2575 | 100 57 19 | 2566 | 99 17 37 | 2556 | 97 37 42 | 2547 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XV$^{h}$. | P. L. of Diff. | XVIII$^{h}$. | P. L. of Diff. | XXI$^{h}$. | P. L of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Pollux | W. | 91° 50′ 15″ | 2880 | 93° 23′ 0″ | 2893 | 94° 55′ 28″ | 2906 | 96° 27′ 39″ | 2919 |
| | Regulus | W. | 55 4 17 | 2883 | 56 36 58 | 2895 | 58 9 23 | 2909 | 59 41 31 | 2921 |
| | Jupiter | E. | 33 52 24 | 2993 | 32 22 2 | 3011 | 30 52 3 | 3030 | 29 22 28 | 3049 |
| | Antares | E. | 44 53 15 | 2877 | 43 20 27 | 2891 | 41 47 57 | 2904 | 40 15 43 | 2916 |
| | Sun | E. | 94 8 54 | 3265 | 92 44 1 | 3280 | 91 19 26 | 3294 | 89 55 7 | 3307 |
| 18 | Pollux | W. | 104 4 47 | 2975 | 105 35 31 | 2985 | 107 6 3 | 2994 | 108 36 23 | 3003 |
| | Regulus | W. | 67 18 26 | 2977 | 68 49 8 | 2986 | 70 19 38 | 2996 | 71 49 56 | 3004 |
| | Antares | E. | 32 38 19 | 2972 | 31 7 31 | 2982 | 29 36 56 | 2992 | 28 6 33 | 3001 |
| | Sun | E. | 82 57 18 | 3368 | 81 34 25 | 3379 | 80 11 44 | 3389 | 78 49 15 | 3400 |
| 19 | Pollux | W. | 116 5 28 | 3042 | 117 34 49 | 3047 | 119 4 3 | 3053 | 120 33 10 | 3059 |
| | Regulus | W. | 79 18 55 | 3042 | 80 48 16 | 3048 | 82 17 29 | 3054 | 83 46 35 | 3059 |
| | Spica | W. | 25 16 49 | 3039 | 26 46 14 | 3044 | 28 15 32 | 3051 | 29 44 42 | 3056 |
| | Antares | E. | 20 37 12 | 3039 | 19 7 47 | 3044 | 17 38 29 | 3050 | 16 9 18 | 3056 |
| | Sun | E. | 71 59 29 | 3441 | 70 37 59 | 3447 | 69 16 36 | 3454 | 67 55 21 | 3460 |
| 20 | Regulus | W. | 91 10 41 | 3078 | 92 39 17 | 3082 | 94 7 49 | 3083 | 95 36 19 | 3086 |
| | Spica | W. | 37 9 9 | 3075 | 38 37 49 | 3078 | 40 6 26 | 3080 | 41 35 0 | 3082 |
| | Sun | E. | 61 10 34 | 3483 | 59 49 51 | 3487 | 58 29 12 | 3489 | 57 8 36 | 3491 |
| 21 | Regulus | W. | 102 58 24 | 3088 | 104 26 48 | 3088 | 105 55 12 | 3087 | 107 23 37 | 3086 |
| | Spica | W. | 48 57 27 | 3085 | 50 25 55 | 3084 | 51 54 24 | 3083 | 53 22 54 | 3082 |
| | Sun | E. | 50 26 6 | 3497 | 49 5 39 | 3498 | 47 45 13 | 3498 | 46 24 47 | 3497 |
| 22 | Regulus | W. | 114 46 13 | 3075 | 116 14 53 | 3073 | 117 43 36 | 3069 | 119 12 23 | 3066 |
| | Spica | W. | 60 45 52 | 3071 | 62 14 37 | 3069 | 63 43 25 | 3065 | 65 12 18 | 3061 |
| | Sun | E. | 39 42 22 | 3491 | 38 21 48 | 3490 | 37 1 13 | 3488 | 35 40 36 | 3487 |
| 23 | Spica | W. | 72 37 55 | 3039 | 74 7 19 | 3034 | 75 36 50 | 3029 | 77 6 27 | 3023 |
| | Antares | W. | 26 43 58 | 3039 | 28 13 22 | 3034 | 29 42 53 | 3029 | 31 12 30 | 3023 |
| | Sun | E. | 28 57 1 | 3479 | 27 36 13 | 3478 | 26 15 24 | 3477 | 24 54 34 | 3479 |
| 24 | Antares | W. | 38 42 22 | 2993 | 40 12 43 | 2987 | 41 43 12 | 2980 | 43 13 50 | 2973 |
| 28 | Sun | W. | 27 57 21 | 3159 | 29 24 19 | 3146 | 30 51 33 | 3133 | 32 19 2 | 3120 |
| | α Arietis | E. | 60 30 3 | 2792 | 58 55 25 | 2785 | 57 20 37 | 2779 | 55 45 41 | 2772 |
| | Aldebaran | E. | 91 29 18 | 2818 | 89 55 14 | 2810 | 88 20 59 | 2801 | 86 46 33 | 2794 |
| 29 | Sun | W. | 39 40 9 | 3062 | 41 9 5 | 3052 | 42 38 14 | 3041 | 44 7 36 | 3030 |
| | α Arietis | E. | 47 48 53 | 2741 | 46 13 8 | 2736 | 44 37 16 | 2731 | 43 1 17 | 2726 |
| | Aldebaran | E. | 78 51 47 | 2754 | 77 16 19 | 2746 | 75 40 40 | 2739 | 74 4 52 | 2731 |
| | Pollux | E. | 122 14 16 | 2684 | 120 37 15 | 3676 | 119 0 3 | 2667 | 117 22 39 | 2657 |
| 30 | Sun | W. | 51 37 49 | 2976 | 53 8 32 | 2965 | 54 39 28 | 2955 | 56 10 37 | 2944 |
| | Venus | W. | 20 35 27 | 3036 | 22 4 55 | 3026 | 23 34 36 | 3015 | 25 4 30 | 3005 |
| | α Arietis | E. | 35 0 5 | 2712 | 33 23 41 | 2713 | 31 47 18 | 2714 | 30 10 57 | 2719 |
| | Aldebaran | E. | 66 3 20 | 2695 | 64 26 33 | 2688 | 62 49 37 | 2681 | 61 12 32 | 2675 |
| | Pollux | E. | 109 12 35 | 2612 | 107 33 57 | 2604 | 105 55 7 | 2594 | 104 16 4 | 2585 |
| 31 | Sun | W. | 63 49 49 | 2890 | 65 22 21 | 2879 | 66 55 7 | 2868 | 68 28 7 | 2856 |
| | Venus | W. | 32 37 15 | 2952 | 34 8 28 | 2942 | 35 39 54 | 2931 | 37 11 34 | 2920 |
| | α Pegasi | W. | 29 18 42 | 3929 | 30 31 32 | 3786 | 31 46 49 | 3660 | 33 4 19 | 3550 |
| | Aldebaran | E. | 53 5 6 | 2617 | 51 27 15 | 2643 | 49 49 18 | 2639 | 48 11 16 | 2635 |
| | Pollux | E. | 95 57 31 | 2537 | 94 17 12 | 2527 | 92 36 36 | 2517 | 90 55 47 | 2507 |

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be added to Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | Semi-diameter. | | | |
| | | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Tues. | 1 | 20 58 2.36 | 10.200 | S. 17 11 41.6 | +42.47 | 16 16.07 | 68.31 | 13 48.75 | 0.342 |
| Wed. | 2 | 21 2 6.74 | 10.165 | 16 54 33.2 | 43.22 | 16 15.92 | 68.19 | 13 56.55 | 0.307 |
| Thur. | 3 | 21 6 10.28 | 10.130 | 16 37 7.0 | 43.95 | 16 15.77 | 68.08 | 14 3.51 | 0.272 |
| Frid. | 4 | 21 10 12.97 | 10.094 | 16 19 23.5 | 44.66 | 16 15.62 | 67.96 | 14 9.62 | 0.238 |
| Sat. | 5 | 21 14 14.82 | 10.060 | 16 1 23.4 | 45.35 | 16 15.46 | 67.85 | 14 14.90 | 0.204 |
| *Sun.* | 6 | 21 18 15.85 | 10.025 | 15 43 6.9 | 46.03 | 16 15.30 | 67.73 | 14 19.36 | 0.170 |
| Mon. | 7 | 21 22 16.06 | 9.991 | 15 24 34.3 | 46.69 | 16 15.13 | 67.62 | 14 23.01 | 0.136 |
| Tues. | 8 | 21 26 15.46 | 9.958 | 15 5 46.1 | 47.33 | 16 14.96 | 67.50 | 14 25.85 | 1.102 |
| Wed. | 9 | 21 30 14.05 | 9.925 | 14 46 42.9 | 47.95 | 16 14.79 | 67.39 | 14 27.88 | 0.068 |
| Thur. | 10 | 21 34 11.83 | 9.892 | 14 27 24.7 | 48.56 | 16 14.61 | 67.28 | 14 29.11 | 0.035 |
| Frid. | 11 | 21 38 8.83 | 9.860 | 14 7 52.1 | 49.15 | 16 14.42 | 67.17 | 14 29.55 | +0.003 |
| Sat. | 12 | 21 42 5.08 | 9.828 | 13 48 5.6 | 49.73 | 16 14.23 | 67.06 | 14 29.23 | −0.029 |
| *Sun.* | 13 | 21 46 0.57 | 9.797 | 13 28 5.6 | 50.29 | 16 14.03 | 66.95 | 14 28.17 | 0.060 |
| Mon. | 14 | 21 49 55.31 | 9.767 | 13 7 52.3 | 50.83 | 16 13.83 | 66.85 | 14 26.37 | 0.090 |
| Tues. | 15 | 21 53 49.33 | 9.736 | 12 47 26.1 | 51.35 | 16 13.62 | 66.74 | 14 23.83 | 0.120 |
| Wed. | 16 | 21 57 42.64 | 9.707 | 12 26 47.4 | 51.86 | 16 13.41 | 66.64 | 14 20.59 | 0.149 |
| Thur. | 17 | 22 1 35.25 | 9.678 | 12 5 56.7 | 52.35 | 16 13.20 | 66.53 | 14 16.65 | 0.178 |
| Frid. | 18 | 22 5 27.16 | 9.649 | 11 44 54.4 | 52.83 | 16 12.98 | 66.43 | 14 12.02 | 0.206 |
| Sat. | 19 | 22 9 18.38 | 9.621 | 11 23 41.0 | 53.29 | 16 12.76 | 66.33 | 14 6.70 | 0.234 |
| *Sun.* | 20 | 22 13 8.93 | 9.593 | 11 2 16.5 | 53.73 | 16 12.53 | 66.23 | 14 0.71 | 0.262 |
| Mon. | 21 | 22 16 58.83 | 9.566 | 10 40 41.7 | 54.15 | 16 12.31 | 66.13 | 13 54.08 | 0.289 |
| Tues. | 22 | 22 20 48.10 | 9.540 | 10 18 57.0 | 54.56 | 16 12.08 | 66.04 | 13 46.82 | 0.315 |
| Wed. | 23 | 22 24 36.75 | 9.514 | 9 57 2.7 | 54.95 | 16 11.85 | 65.95 | 13 38.94 | 0.341 |
| Thur. | 24 | 22 28 24.78 | 9.489 | 9 34 59.4 | 55.32 | 16 11.62 | 65.86 | 13 30.44 | 0.366 |
| Frid. | 25 | 22 32 12.20 | 9.464 | 9 12 47.6 | 55.67 | 16 11.39 | 65.78 | 13 21.33 | 0.391 |
| Sat. | 26 | 22 35 59.02 | 9.440 | 8 50 27.3 | 56.01 | 16 11.16 | 65.69 | 13 11.63 | 0.415 |
| *Sun.* | 27 | 22 39 45.27 | 9.416 | 8 27 59.1 | 56.33 | 16 10.93 | 65.61 | 13 1.35 | 0.439 |
| Mon. | 28 | 22 43 30.96 | 9.393 | 8 5 23.7 | 56.62 | 16 10.69 | 65.53 | 12 50.51 | 0.462 |
| Tues. | 29 | 22 47 16.11 | 9.370 | 7 42 41.5 | 56.91 | 16 10.45 | 65.45 | 12 39.13 | 0.485 |
| Wed. | 30 | 22 51 0.72 | 9.348 | S. 7 19 52.5 | +57.16 | 16 10.21 | 65.38 | 12 27.22 | 0.507 |

**Note.—Mean Time of the Semidiameter passing may be found by subtracting $0^{s}.18$ from the Sidereal Time.**

+ prefixed to the hourly change of declination, indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, *to be subtracted from Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | | | |
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Tues. | 1 | 20 58 0.01 | 10.199 | S. 17 11 51.3 | +42.46 | 13 48.67 | 0.342 | 20 44 11.34 |
| Wed. | 2 | 21 2 4.38 | 10.164 | 16 54 43.2 | 43.21 | 13 56.48 | 0.307 | 20 48 7.90 |
| Thur. | 3 | 21 6 7.91 | 10.129 | 16 37 17.2 | 43.94 | 14 3.45 | 0.272 | 20 52 4.46 |
| Frid. | 4 | 21 10 10.59 | 10.094 | 16 19 34.0 | 44.65 | 14 9.57 | 0.238 | 20 56 1.02 |
| Sat. | 5 | 21 14 12.43 | 10.060 | 16 1 34.1 | 45.34 | 14 14.86 | 0.204 | 20 59 57.57 |
| *Sun.* | 6 | 21 18 13.45 | 10.025 | 15 43 17.7 | 46.02 | 14 19.32 | 0.170 | 21 3 54.13 |
| Mon. | 7 | 21 22 13.66 | 9.991 | 15 24 45.5 | 46.68 | 14 22.98 | 0.136 | 21 7 50.68 |
| Tues. | 8 | 21 26 13.06 | 9.958 | 15 5 57.5 | 47.32 | 14 25.82 | 0.102 | 21 11 47.24 |
| Wed. | 9 | 21 30 11.65 | 9.925 | 14 46 54.4 | 47.94 | 14 27.86 | 0.068 | 21 15 43.79 |
| Thur. | 10 | 21 34 9.44 | 9.892 | 14 27 36.4 | 48.55 | 14 29.09 | 0.035 | 21 19 40.35 |
| Frid. | 11 | 21 38 6.45 | 9.860 | 14 8 4.0 | 49.14 | 14 29.55 | +0.003 | 21 23 36.90 |
| Sat. | 12 | 21 42 2.70 | 9.828 | 13 48 17.7 | 49.72 | 14 29.24 | −0.029 | 21 27 33.46 |
| *Sun.* | 13 | 21 45 58.20 | 9.797 | 13 28 17.8 | 50.28 | 14 28.19 | 0.060 | 21 31 30.01 |
| Mon. | 14 | 21 49 52.96 | 9.767 | 13 8 4.5 | 50.82 | 14 26.39 | 0.090 | 21 35 26.57 |
| Tues. | 15 | 21 53 46.99 | 9.737 | 12 47 38.4 | 51.35 | 14 23.86 | 0.120 | 21 39 23.13 |
| Wed. | 16 | 21 57 40.32 | 9.708 | 12 26 59.8 | 51.86 | 14 20.63 | 0.149 | 21 43 19.69 |
| Thur. | 17 | 22 1 32.49 | 9.679 | 12 6 9.1 | 52.35 | 14 16.70 | 0.178 | 21 47 16.24 |
| Frid. | 18 | 22 5 24.87 | 9.650 | 11 45 6.9 | 52.83 | 14 12.07 | 0.206 | 21 51 12.80 |
| Sat. | 19 | 22 9 16.11 | 9.622 | 11 23 53.5 | 53.29 | 14 6.76 | 0.234 | 21 55 9.35 |
| *Sun.* | 20 | 22 13 6.68 | 9.594 | 11 2 29.1 | 53.73 | 14 0.77 | 0.262 | 21 59 5.91 |
| Mon. | 21 | 22 16 56.61 | 9.567 | 10 40 54.2 | 54.15 | 13 54.15 | 0.289 | 22 3 2.46 |
| Tues. | 22 | 22 20 45.91 | 9.541 | 10 19 9.5 | 54.56 | 13 46.89 | 0.315 | 22 6 59.02 |
| Wed. | 23 | 22 24 34.58 | 9.515 | 9 57 15.2 | 54.95 | 13 39.01 | 0.341 | 22 10 55.57 |
| Thur. | 24 | 22 28 22.64 | 9.490 | 9 35 11.8 | 55.32 | 13 30.52 | 0.366 | 22 14 52.12 |
| Frid. | 25 | 22 32 10.09 | 9.465 | 9 12 59.9 | 55.67 | 13 21.42 | 0.391 | 22 18 48.67 |
| Sat. | 26 | 22 35 56.95 | 9.441 | 8 50 39.6 | 56.01 | 13 11.72 | 0.415 | 22 22 45.23 |
| *Sun.* | 27 | 22 39 43.23 | 9.417 | 8 28 11.3 | 56.33 | 13 1.45 | 0.439 | 22 26 41.78 |
| Mon. | 28 | 22 43 28.95 | 9.394 | 8 5 35.8 | 56.62 | 12 50.61 | 0.462 | 22 30 38.34 |
| Tues. | 29 | 22 47 14.13 | 9.371 | 7 42 53.4 | 56.91 | 12 39.24 | 0.485 | 22 34 34.89 |
| Wed. | 30 | 22 50 58.78 | 9.349 | S. 7 20 4.3 | +57.17 | 12 27.33 | 0.507 | 22 38 31.45 |

**Note.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.**

**Diff. for 1 hour.**
$+9^{s}.8565$

## AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | *True* LONGITUDE. | | Diff. for 1 hour. | LATITUDE. | | | |
| | | λ | λ′ | | | | | |
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 32 | 312 2 23.6 | 2 18.5 | 152.20 | +0.33 | 9.9936953 | +26.4 | 3 15 16.58 |
| 2 | 33 | 313 3 15.7 | 3 10.4 | 152.14 | 0.46 | .9937593 | 27.1 | 3 11 20 66 |
| 3 | 34 | 314 4 6.3 | 4 0.8 | 152.08 | 0.56 | .9938252 | 27.9 | 3 7 24.75 |
| 4 | 35 | 315 4 55.3 | 4 49.7 | 152.02 | 0.62 | .9938931 | 28.8 | 3 3 28.84 |
| 5 | 36 | 316 5 42.9 | 5 37.2 | 151.96 | 0.66 | .9939632 | 29.7 | 2 59 32.93 |
| 6 | 37 | 317 6 29.1 | 6 23.2 | 151.90 | 0.68 | .9940353 | 30.6 | 2 55 37.02 |
| 7 | 38 | 318 7 13.9 | 7 7.8 | 151.84 | 0.65 | .9941095 | 31.5 | 2 51 41.12 |
| 8 | 39 | 319 7 57.2 | 7 51.0 | 151.78 | 0.61 | .9941862 | 32.5 | 2 47 45.21 |
| 9 | 40 | 320 8 39.1 | 8 32.8 | 151.72 | 0.53 | .9942651 | 33.4 | 2 43 49.29 |
| 10 | 41 | 321 9 19.6 | 9 13.2 | 151.66 | 0.43 | .9943463 | 34.4 | 2 39 53.38 |
| 11 | 42 | 322 9 58.7 | 9 52.1 | 151.60 | 0.31 | .9944299 | 35.3 | 2 35 57.47 |
| 12 | 43 | 323 10 36.5 | 10 29.7 | 151.55 | 0.19 | .9945156 | 36.2 | 2 32 1.56 |
| 13 | 44 | 324 11 13.1 | 11 6.2 | 151.50 | +0.06 | .9946037 | 37.1 | 2 28 5.65 |
| 14 | 45 | 325 11 48.4 | 11 41.4 | 151.45 | −0.06 | .9946938 | 37.9 | 2 24 9.74 |
| 15 | 46 | 326 12 22.5 | 12 15.4 | 151.40 | 0.19 | .9947858 | 38.7 | 2 20 13.83 |
| 16 | 47 | 327 12 55.3 | 12 48.0 | 151.34 | 0.29 | .9948796 | 39.5 | 2 16 17.92 |
| 17 | 48 | 328 13 26.8 | 13 19.3 | 151.29 | 0.38 | .9949751 | 40.1 | 2 12 22.01 |
| 18 | 49 | 329 13 57.0 | 13 49.4 | 151.24 | 0.43 | .9950721 | 40.6 | 2 8 26.09 |
| 19 | 50 | 330 14 26.0 | 14 18.3 | 151.19 | 0.47 | .9951702 | 41.1 | 2 4 30.18 |
| 20 | 51 | 331 14 53.7 | 14 45.9 | 151.13 | 0.47 | .9952698 | 41.5 | 2 0 34.28 |
| 21 | 52 | 332 15 20.0 | 15 12.0 | 151.07 | 0.42 | .9953702 | 41.9 | 1 56 38.37 |
| 22 | 53 | 333 15 44.7 | 15 36.6 | 151.00 | 0.36 | .9954716 | 42.3 | 1 52 42.46 |
| 23 | 54 | 334 16 7.9 | 15 59.7 | 150.93 | 0.27 | .9955736 | 42.6 | 1 48 46.55 |
| 24 | 55 | 335 16 29.5 | 16 21.2 | 150.86 | 0.17 | .9956764 | 42.9 | 1 44 50.64 |
| 25 | 56 | 336 16 49.3 | 16 40.9 | 150.79 | −0.04 | .9957799 | 43.2 | 1 40 54.74 |
| 26 | 57 | 337 17 7.4 | 16 58.9 | 150.72 | +0.09 | .9958841 | 43.5 | 1 36 58.83 |
| 27 | 58 | 338 17 23.7 | 17 15.0 | 150.64 | 0.22 | .9959888 | 43.8 | 1 33 2.92 |
| 28 | 59 | 339 17 38.0 | 17 29.2 | 150.56 | 0.35 | .9960942 | 44.0 | 1 29 7.01 |
| 29 | 60 | 340 17 50.3 | 17 41.4 | 150.48 | 0.48 | .9962004 | 44.3 | 1 25 11.10 |
| 30 | 61 | 341 18 0.6 | 17 51.6 | 150.39 | +0.59 | 9.9963073 | +44.7 | 1 21 15.19 |

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
$-9^s.8296$

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | MERIDIAN PASSAGE. | | AGE. |
|---|---|---|---|---|---|---|---|---|---|
| | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. | | Diff. for 1 hour. | Noon. |
| | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 15 47.6 | 15 52.3 | 57 51.2 | +1.41 | 58 8.3 | +1.43 | 4 43.3 | 1.96 | 5.9 |
| 2 | 15 56.9 | 16 1.6 | 58 25.5 | 1.43 | 58 42.6 | 1.41 | 5 32.3 | 2.13 | 6.9 |
| 3 | 16 6.1 | 16 10.5 | 58 59.2 | 1.37 | 59 15.3 | 1.30 | 6 26.0 | 2.35 | 7.9 |
| 4 | 16 14.6 | 16 18.3 | 59 30.3 | 1.20 | 59 44.0 | 1.07 | 7 24.8 | 2.56 | 8.9 |
| 5 | 16 21.6 | 16 24.2 | 59 55.9 | 0.91 | 60 5.6 | 0.70 | 8 28.2 | 2.71 | 9.9 |
| 6 | 16 26.1 | 16 27.3 | 60 12.7 | +0.48 | 60 16.9 | +0.22 | 9 33.8 | 2.73 | 10.9 |
| 7 | 16 27.6 | 16 26.8 | 60 17.9 | −0.07 | 60 15.3 | −0.36 | 10 38.0 | 2.61 | 11.9 |
| 8 | 16 25.2 | 16 22.6 | 60 9.3 | 0.65 | 59 59.7 | 0.95 | 11 38.2 | 2.40 | 12.9 |
| 9 | 16 19.0 | 16 14.6 | 59 46.6 | 1.23 | 59 30.4 | 1.47 | 12 33.3 | 2.19 | 13.9 |
| 10 | 16 9.5 | 16 3.7 | 59 11.5 | 1.68 | 58 50.2 | 1.86 | 13 23.7 | 2.01 | 14.9 |
| 11 | 15 57.4 | 15 50.7 | 58 27.0 | 1.99 | 58 2.6 | 2.08 | 14 10.5 | 1.89 | 15.9 |
| 12 | 15 43.8 | 15 36.9 | 57 37.4 | 2.12 | 57 12.0 | 2.11 | 14 54.9 | 1.82 | 16.9 |
| 13 | 15 30.1 | 15 23.5 | 56 46.9 | 2.06 | 56 22.7 | 1.97 | 15 38.4 | 1.81 | 17.9 |
| 14 | 15 17.2 | 15 11.4 | 55 59.7 | 1.85 | 55 38.3 | 1.72 | 16 22.2 | 1.84 | 18.9 |
| 15 | 15 6.1 | 15 1.4 | 55 18.7 | 1.54 | 55 1.4 | 1.35 | 17 7.2 | 1.91 | 19.9 |
| 16 | 14 57.3 | 14 53.9 | 54 46.4 | 1.15 | 54 33.9 | 0.94 | 17 54.0 | 2.00 | 20.9 |
| 17 | 14 51.2 | 14 49.2 | 54 23.9 | 0.73 | 54 16.5 | 0.50 | 18 43.0 | 2.08 | 21.9 |
| 18 | 14 47.9 | 14 47.3 | 54 11.8 | −0.28 | 54 9.7 | −0.07 | 19 33.8 | 2.14 | 22.9 |
| 19 | 14 47.5 | 14 48.2 | 54 10.2 | +0.14 | 54 13.0 | +0.33 | 20 25.6 | 2.16 | 23.9 |
| 20 | 14 49.6 | 14 51.6 | 54 18.1 | 0.52 | 54 25.4 | 0.70 | 21 17.2 | 2.13 | 24.9 |
| 21 | 14 54.1 | 14 57.1 | 54 34.7 | 0.85 | 54 45.7 | 0.98 | 22 7.6 | 2.06 | 25.9 |
| 22 | 15 0.5 | 15 4.2 | 54 58.1 | 1.09 | 55 11.8 | 1.19 | 22 56.1 | 1.98 | 26.9 |
| 23 | 15 8.2 | 15 12.4 | 55 26.5 | 1.26 | 55 41.9 | 1.31 | 23 42.6 | 1.90 | 27.9 |
| 24 | 15 16.8 | 15 21.2 | 55 57.9 | 1.35 | 56 14.1 | 1.35 | ☌ | | 28.9 |
| 25 | 15 25.6 | 15 29.9 | 56 30.3 | 1.34 | 56 46.3 | 1.32 | 0 27.5 | 1.84 | 0.2 |
| 26 | 15 34.2 | 15 38.4 | 57 2.0 | 1.29 | 57 17.2 | 1.24 | 1 11.5 | 1.83 | 1.2 |
| 27 | 15 42.3 | 15 46.1 | 57 31.8 | 1.19 | 57 45.6 | 1.12 | 1 55.7 | 1.86 | 2.2 |
| 28 | 15 49.6 | 15 53.0 | 57 58.6 | 1.05 | 58 10.9 | 0.99 | 2 41.3 | 1.95 | 3.2 |
| 29 | 15 56.1 | 15 59.0 | 58 22.3 | 0.92 | 58 32.9 | 0.85 | 3 29.7 | 2.09 | 4.2 |
| 30 | 16 1.6 | 16 4.0 | 58 42.6 | +0.78 | 58 51.5 | +0.71 | 4 21.9 | 2.27 | 5.2 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

### TUESDAY 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 1 18 35.11 | 2.0411 | N.10 23 1.3 | 15.213 |
| 1 | 1 20 37.72 | 2.0460 | 10 38 13.0 | 15.175 |
| 2 | 1 22 40.63 | 2.0511 | 10 53 22.3 | 15.136 |
| 3 | 1 24 43.85 | 2.0562 | 11 8 29.3 | 15.097 |
| 4 | 1 26 47.37 | 2.0614 | 11 23 33.9 | 15.055 |
| 5 | 1 28 51.21 | 2.0668 | 11 38 35.9 | 15.012 |
| 6 | 1 30 55.38 | 2.0722 | 11 53 35.3 | 14.967 |
| 7 | 1 32 59.87 | 2.0776 | 12 8 32.0 | 14.922 |
| 8 | 1 35 4.69 | 2.0831 | 12 23 26.0 | 14.876 |
| 9 | 1 37 9.84 | 2.0886 | 12 38 17.1 | 14.827 |
| 10 | 1 39 15.32 | 2.0942 | 12 53 5.2 | 14.777 |
| 11 | 1 41 21.14 | 2.1000 | 13 7 50.3 | 14.725 |
| 12 | 1 43 27.32 | 2.1059 | 13 22 32.2 | 14.672 |
| 13 | 1 45 33.85 | 2.1118 | 13 37 10.9 | 14.618 |
| 14 | 1 47 40.74 | 2.1179 | 13 51 46.3 | 14.562 |
| 15 | 1 49 48.00 | 2.1241 | 14 6 18.3 | 14.504 |
| 16 | 1 51 55.63 | 2.1303 | 14 20 46.8 | 14.445 |
| 17 | 1 54 3.64 | 2.1367 | 14 35 11.7 | 14.384 |
| 18 | 1 56 12.04 | 2.1432 | 14 49 32.9 | 14.322 |
| 19 | 1 58 20.82 | 2.1496 | 15 3 50.3 | 14.258 |
| 20 | 2 0 29.99 | 2.1561 | 15 18 3.9 | 14.193 |
| 21 | 2 2 39.55 | 2.1627 | 15 32 13.5 | 14.126 |
| 22 | 2 4 49.51 | 2.1693 | 15 46 19.0 | 14.057 |
| 23 | 2 6 59.87 | 2.1760 | N.16 0 20.4 | 13.987 |

### WEDNESDAY 2.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 2 9 10.63 | 2.1828 | N.16 14 17.5 | 13.916 |
| 1 | 2 11 21.80 | 2.1897 | 16 28 10.3 | 13.842 |
| 2 | 2 13 33.40 | 2.1968 | 16 41 58.6 | 13.767 |
| 3 | 2 15 45.42 | 2.2039 | 16 55 42.3 | 13.689 |
| 4 | 2 17 57.87 | 2.2111 | 17 9 21.3 | 13.611 |
| 5 | 2 20 10.75 | 2.2183 | 17 22 55.6 | 13.532 |
| 6 | 2 22 24.07 | 2.2256 | 17 36 25.1 | 13.450 |
| 7 | 2 24 37.82 | 2.2329 | 17 49 49.6 | 13.366 |
| 8 | 2 26 52.01 | 2.2402 | 18 3 9.0 | 13.281 |
| 9 | 2 29 6.65 | 2.2477 | 18 16 23.3 | 13.194 |
| 10 | 2 31 21.74 | 2.2552 | 18 29 32.3 | 13.105 |
| 11 | 2 33 37.28 | 2.2628 | 18 42 35.9 | 13.014 |
| 12 | 2 35 53.28 | 2.2705 | 18 55 34.0 | 12.922 |
| 13 | 2 38 9.74 | 2.2782 | 19 8 26.5 | 12.828 |
| 14 | 2 40 26.66 | 2.2859 | 19 21 13.3 | 12.732 |
| 15 | 2 42 44.05 | 2.2936 | 19 33 54.4 | 12.635 |
| 16 | 2 45 1.90 | 2.3014 | 19 46 29.5 | 12.535 |
| 17 | 2 47 20.22 | 2.3093 | 19 58 58.6 | 12.433 |
| 18 | 2 49 39.02 | 2.3172 | 20 11 21.5 | 12.330 |
| 19 | 2 51 58.29 | 2.3252 | 20 23 38.2 | 12.225 |
| 20 | 2 54 18.05 | 2.3333 | 20 35 48.5 | 12.118 |
| 21 | 2 56 38.29 | 2.3414 | 20 47 52.4 | 12.010 |
| 22 | 2 58 59.02 | 2.3495 | 20 59 49.7 | 11.899 |
| 23 | 3 1 20.23 | 2.3576 | 21 11 40.3 | 11.787 |
| 24 | 3 3 41.93 | 2.3657 | N.21 23 24.1 | 11.673 |

### THURSDAY 3.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 3 3 41.93 | 2.3657 | N.21 23 24.1 | 11.673 |
| 1 | 3 6 4.12 | 2.3739 | 21 35 1.0 | 11.557 |
| 2 | 3 8 26.80 | 2.3821 | 21 46 30.9 | 11.438 |
| 3 | 3 10 49.97 | 2.3903 | 21 57 53.6 | 11.318 |
| 4 | 3 13 13.64 | 2.3986 | 22 9 9.1 | 11.197 |
| 5 | 3 15 37.80 | 2.4068 | 22 20 17.2 | 11.073 |
| 6 | 3 18 2.45 | 2.4150 | 22 31 17.8 | 10.947 |
| 7 | 3 20 27.60 | 2.4232 | 22 42 10.8 | 10.819 |
| 8 | 3 22 53.24 | 2.4315 | 22 52 56.1 | 10.690 |
| 9 | 3 25 19.38 | 2.4398 | 23 3 33.6 | 10.559 |
| 10 | 3 27 46.02 | 2.4481 | 23 14 3.2 | 10.426 |
| 11 | 3 30 13.16 | 2.4564 | 23 24 24.7 | 10.290 |
| 12 | 3 32 40.79 | 2.4646 | 23 34 38.0 | 10.153 |
| 13 | 3 35 8.91 | 2.4729 | 23 44 43.1 | 10.014 |
| 14 | 3 37 37.53 | 2.4811 | 23 54 39.7 | 9.873 |
| 15 | 3 40 6.64 | 2.4892 | 24 4 27.8 | 9.730 |
| 16 | 3 42 36.24 | 2.4973 | 24 14 7.3 | 9.586 |
| 17 | 3 45 6.32 | 2.5054 | 24 23 38.1 | 9.439 |
| 18 | 3 47 36.89 | 2.5135 | 24 33 0.0 | 9.290 |
| 19 | 3 50 7.94 | 2.5216 | 24 42 12.9 | 9.139 |
| 20 | 3 52 39.48 | 2.5297 | 24 51 16.7 | 8.988 |
| 21 | 3 55 11.50 | 2.5377 | 25 0 11.4 | 8.834 |
| 22 | 3 57 44.00 | 2.5456 | 25 8 56.8 | 8.677 |
| 23 | 4 0 16.97 | 2.5534 | N.25 17 32.7 | 8.519 |

### FRIDAY 4.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 4 2 50.41 | 2.5612 | N.25 25 59.1 | 8.360 |
| 1 | 4 5 24.31 | 2.5689 | 25 34 15.9 | 8.198 |
| 2 | 4 7 58.68 | 2.5767 | 25 42 22.9 | 8.035 |
| 3 | 4 10 33.51 | 2.5843 | 25 50 20.1 | 7.870 |
| 4 | 4 13 8.79 | 2.5918 | 25 58 7.3 | 7.703 |
| 5 | 4 15 44.52 | 2.5991 | 26 5 44.4 | 7.534 |
| 6 | 4 18 20.69 | 2.6064 | 26 13 11.4 | 7.364 |
| 7 | 4 20 57.29 | 2.6137 | 26 20 28.1 | 7.192 |
| 8 | 4 23 34.33 | 2.6209 | 26 27 34.4 | 7.018 |
| 9 | 4 26 11.80 | 2.6280 | 26 34 30.2 | 6.842 |
| 10 | 4 28 49.69 | 2.6350 | 26 41 15.4 | 6.665 |
| 11 | 4 31 28.00 | 2.6418 | 26 47 50.0 | 6.487 |
| 12 | 4 34 6.71 | 2.6485 | 26 54 13.8 | 6.306 |
| 13 | 4 36 45.82 | 2.6552 | 27 0 26.7 | 6.123 |
| 14 | 4 39 25.33 | 2.6617 | 27 6 28.6 | 5.940 |
| 15 | 4 42 5.22 | 2.6680 | 27 12 19.5 | 5.755 |
| 16 | 4 44 45.49 | 2.6742 | 27 17 59.2 | 5.568 |
| 17 | 4 47 26.12 | 2.6803 | 27 23 27.7 | 5.380 |
| 18 | 4 50 7.12 | 2.6862 | 27 28 44.8 | 5.190 |
| 19 | 4 52 48.47 | 2.6920 | 27 33 50.5 | 4.999 |
| 20 | 4 55 30.16 | 2.6977 | 27 38 44.7 | 4.807 |
| 21 | 4 58 12.19 | 2.7033 | 27 43 27.4 | 4.614 |
| 22 | 5 0 54.55 | 2.7087 | 27 47 58.4 | 4.418 |
| 23 | 5 3 37.23 | 2.7138 | 27 52 17.6 | 4.222 |
| 24 | 5 6 20.21 | 2.7188 | N.27 56 25.0 | 4.025 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SATURDAY 5.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 5 6 20.21 | 2.7188 | N.27 56 25.0 | 4.025 |
| 1 | 5 9 3.49 | 2.7237 | 28 0 20.6 | 3.827 |
| 2 | 5 11 47.05 | 2.7283 | 28 4 4.2 | 3.626 |
| 3 | 5 14 30.89 | 2.7328 | 28 7 35.7 | 3.425 |
| 4 | 5 17 14.99 | 2.7371 | 28 10 55.2 | 3.223 |
| 5 | 5 19 59.34 | 2.7412 | 28 14 2.5 | 3.020 |
| 6 | 5 22 43.94 | 2.7452 | 28 16 57.6 | 2.816 |
| 7 | 5 25 28.77 | 2.7490 | 28 19 40.4 | 2.611 |
| 8 | 5 28 13.82 | 2.7526 | 28 22 10.9 | 2.405 |
| 9 | 5 30 59.08 | 2.7559 | 28 24 29.0 | 2.198 |
| 10 | 5 33 44.53 | 2.7590 | 28 26 34.7 | 1.991 |
| 11 | 5 36 30.16 | 2.7620 | 28 28 27.9 | 1.782 |
| 12 | 5 39 15.97 | 2.7648 | 28 30 8.6 | 1.573 |
| 13 | 5 42 1.94 | 2.7673 | 28 31 36.7 | 1.363 |
| 14 | 5 44 48.05 | 2.7697 | 28 32 52.2 | 1.154 |
| 15 | 5 47 34.30 | 2.7718 | 28 33 55.2 | 0.944 |
| 16 | 5 50 20.67 | 2.7738 | 28 34 45.5 | 0.732 |
| 17 | 5 53 7.15 | 2.7756 | 28 35 23.0 | 0.519 |
| 18 | 5 55 53.74 | 2.7771 | 28 35 47.8 | 0.307 |
| 19 | 5 58 40.41 | 2.7783 | 28 35 59.9 | +0.096 |
| 20 | 6 1 27.14 | 2.7793 | 28 35 59.3 | −0.117 |
| 21 | 6 4 13.93 | 2.7802 | 28 35 45.9 | 0.330 |
| 22 | 6 7 0.76 | 2.7808 | 28 35 19.7 | 0.543 |
| 23 | 6 9 47.62 | 2.7813 | N.28 34 40.7 | 0.756 |

### SUNDAY 6.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 6 12 34.51 | 2.7815 | N.28 33 49.0 | 0.968 |
| 1 | 6 15 21.40 | 2.7814 | 28 32 44.5 | 1.182 |
| 2 | 6 18 8.28 | 2.7812 | 28 31 27.2 | 1.396 |
| 3 | 6 20 55.14 | 2.7807 | 28 29 57.0 | 1.609 |
| 4 | 6 23 41.97 | 2.7801 | 28 28 14.1 | 1.822 |
| 5 | 6 26 28.75 | 2.7792 | 28 26 18.4 | 2.034 |
| 6 | 6 29 15.47 | 2.7781 | 28 24 10.0 | 2.246 |
| 7 | 6 32 2.12 | 2.7767 | 28 21 48.9 | 2.458 |
| 8 | 6 34 48.68 | 2.7752 | 28 19 15.1 | 2.670 |
| 9 | 6 37 35.14 | 2.7734 | 28 16 28.5 | 2.882 |
| 10 | 6 40 21.49 | 2.7715 | 28 13 29.2 | 3.092 |
| 11 | 6 43 7.72 | 2.7693 | 28 10 17.4 | 3.302 |
| 12 | 6 45 53.81 | 2.7669 | 28 6 53.0 | 3.511 |
| 13 | 6 48 39.75 | 2.7643 | 28 3 16.1 | 3.720 |
| 14 | 6 51 25.53 | 2.7616 | 27 59 26.6 | 3.929 |
| 15 | 6 54 11.14 | 2.7586 | 27 55 24.6 | 4.137 |
| 16 | 6 56 56.56 | 2.7553 | 27 51 10.2 | 4.343 |
| 17 | 6 59 41.78 | 2.7519 | 27 46 43.5 | 4.548 |
| 18 | 7 2 26.79 | 2.7483 | 27 42 4.5 | 4.753 |
| 19 | 7 5 11.58 | 2.7446 | 27 37 13.2 | 4.957 |
| 20 | 7 7 56.14 | 2.7406 | 27 32 9.7 | 5.159 |
| 21 | 7 10 40.45 | 2.7364 | 27 26 54.1 | 5.361 |
| 22 | 7 13 24.51 | 2.7322 | 27 21 26.4 | 5.561 |
| 23 | 7 16 8.31 | 2.7277 | 27 15 46.8 | 5.760 |
| 24 | 7 18 51.83 | 2.7229 | N.27 9 55.2 | 5.959 |

### MONDAY 7.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 7 18 51.83 | 2.7229 | N.27 9 55.2 | 5.959 |
| 1 | 7 21 35.06 | 2.7181 | 27 3 51.7 | 6.156 |
| 2 | 7 24 18.00 | 2.7131 | 26 57 36.5 | 6.351 |
| 3 | 7 27 0.63 | 2.7079 | 26 51 9.6 | 6.545 |
| 4 | 7 29 42.95 | 2.7026 | 26 44 31.1 | 6.738 |
| 5 | 7 32 24.94 | 2.6970 | 26 37 41.0 | 6.931 |
| 6 | 7 35 6.59 | 2.6913 | 26 30 39.4 | 7.121 |
| 7 | 7 37 47.90 | 2.6856 | 26 23 26.5 | 7.309 |
| 8 | 7 40 28.86 | 2.6797 | 26 16 2.3 | 7.496 |
| 9 | 7 43 9.47 | 2.6737 | 26 8 27.0 | 7.681 |
| 10 | 7 45 49.71 | 2.6675 | 26 0 40.6 | 7.865 |
| 11 | 7 48 29.57 | 2.6611 | 25 52 43.2 | 8.047 |
| 12 | 7 51 9.04 | 2.6546 | 25 44 35.0 | 8.227 |
| 13 | 7 53 48.12 | 2.6481 | 25 36 16.0 | 8.406 |
| 14 | 7 56 26.81 | 2.6415 | 25 27 46.3 | 8.583 |
| 15 | 7 59 5.10 | 2.6347 | 25 19 6.0 | 8.758 |
| 16 | 8 1 42.98 | 2.6277 | 25 10 15.3 | 8.931 |
| 17 | 8 4 20.43 | 2.6207 | 25 1 14.3 | 9.102 |
| 18 | 8 6 57.46 | 2.6136 | 24 52 3.0 | 9.272 |
| 19 | 8 9 34.06 | 2.6064 | 24 42 41.6 | 9.440 |
| 20 | 8 12 10.23 | 2.5992 | 24 33 10.2 | 9.606 |
| 21 | 8 14 45.97 | 2.5920 | 24 23 28.9 | 9.770 |
| 22 | 8 17 21.27 | 2.5845 | 24 13 37.8 | 9.932 |
| 23 | 8 19 56.11 | 2.5768 | N.24 3 37.1 | 10.092 |

### TUESDAY 8.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 8 22 30.49 | 2.5692 | N.23 53 26.8 | 10.250 |
| 1 | 8 25 4.41 | 2.5616 | 23 43 7.1 | 10.406 |
| 2 | 8 27 37.88 | 2.5540 | 23 32 38.1 | 10.560 |
| 3 | 8 30 10.89 | 2.5462 | 23 21 59.9 | 10.712 |
| 4 | 8 32 43.43 | 2.5384 | 23 11 12.7 | 10.861 |
| 5 | 8 35 15.50 | 2.5305 | 23 0 16.6 | 11.009 |
| 6 | 8 37 47.09 | 2.5226 | 22 49 11.6 | 11.156 |
| 7 | 8 40 18.21 | 2.5147 | 22 37 57.9 | 11.299 |
| 8 | 8 42 48.85 | 2.5067 | 22 26 35.7 | 11.439 |
| 9 | 8 45 19.01 | 2.4987 | 22 15 5.2 | 11.578 |
| 10 | 8 47 48.69 | 2.4906 | 22 3 26.4 | 11.716 |
| 11 | 8 50 17.88 | 2.4825 | 21 51 39.3 | 11.852 |
| 12 | 8 52 46.59 | 2.4744 | 21 39 44.1 | 11.985 |
| 13 | 8 55 14.81 | 2.4663 | 21 27 41.1 | 12.115 |
| 14 | 8 57 42.55 | 2.4582 | 21 15 30.3 | 12.243 |
| 15 | 9 0 9.80 | 2.4501 | 21 3 11.9 | 12.370 |
| 16 | 9 2 36.56 | 2.4419 | 20 50 45.9 | 12.494 |
| 17 | 9 5 2.83 | 2.4338 | 20 38 12.6 | 12.616 |
| 18 | 9 7 28.62 | 2.4257 | 20 25 32.0 | 12.736 |
| 19 | 9 9 53.92 | 2.4176 | 20 12 44.3 | 12.853 |
| 20 | 9 12 18.73 | 2.4094 | 19 59 49.6 | 12.969 |
| 21 | 9 14 43.05 | 2.4013 | 19 46 48.0 | 13.082 |
| 22 | 9 17 6.89 | 2.3933 | 19 33 39.7 | 13.193 |
| 23 | 9 19 30.25 | 2.3852 | 19 20 24.8 | 13.302 |
| 24 | 9 21 53.12 | 2.3772 | N.19 7 3.4 | 13.409 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | WEDNESDAY 9. | | | | | FRIDAY 11. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 9 21 53.12 | 2.3772 | N.19 7 3.4 | 13.409 | 0 | 11 7 39.95 | 2.0568 | N. 6 59 31.3 | 16.171 |
| 1 | 9 24 15.51 | 2.3692 | 18 53 35.7 | 13.513 | 1 | 11 9 43.21 | 2.0520 | 6 43 20.6 | 16.184 |
| 2 | 9 26 37.42 | 2.3612 | 18 40 1.8 | 13.616 | 2 | 11 11 46.19 | 2.0473 | 6 27 9.2 | 16.196 |
| 3 | 9 28 58.86 | 2.3533 | 18 26 21.7 | 13.717 | 3 | 11 13 48.89 | 2.0427 | 6 10 57.1 | 16.207 |
| 4 | 9 31 19.82 | 2.3453 | 18 12 35.7 | 13.815 | 4 | 11 15 51.32 | 2.0382 | 5 54 44.4 | 16.216 |
| 5 | 9 33 40.30 | 2.3373 | 17 58 43.9 | 13.911 | 5 | 11 17 53.47 | 2.0337 | 5 38 31.2 | 16.224 |
| 6 | 9 36 0.30 | 2.3294 | 17 44 46.4 | 14.005 | 6 | 11 19 55.36 | 2.0293 | 5 22 17.5 | 16.231 |
| 7 | 9 38 19.83 | 2.3217 | 17 30 43.3 | 14.097 | 7 | 11 21 56.99 | 2.0251 | 5 6 3.5 | 16.235 |
| 8 | 9 40 38.90 | 2.3140 | 17 16 34.8 | 14.186 | 8 | 11 23 58.37 | 2.0210 | 4 49 49.3 | 16.237 |
| 9 | 9 42 57.51 | 2.3063 | 17 2 21.0 | 14.273 | 9 | 11 25 59.51 | 2.0169 | 4 33 35.0 | 16.239 |
| 10 | 9 45 15.66 | 2.2986 | 16 48 2.0 | 14.359 | 10 | 11 28 0.40 | 2.0128 | 4 17 20.6 | 16.240 |
| 11 | 9 47 33.35 | 2.2909 | 16 33 37.9 | 14.443 | 11 | 11 30 1.05 | 2.0089 | 4 1 6.2 | 16.239 |
| 12 | 9 49 50.57 | 2.2832 | 16 19 8.8 | 14.525 | 12 | 11 32 1.47 | 2.0052 | 3 44 51.9 | 16.237 |
| 13 | 9 52 7.34 | 2.2757 | 16 4 34.9 | 14.603 | 13 | 11 34 1.67 | 2.0015 | 3 28 37.8 | 16.233 |
| 14 | 9 54 23.66 | 2.2683 | 15 49 56.4 | 14.680 | 14 | 11 36 1.65 | 1.9977 | 3 12 23.9 | 16.228 |
| 15 | 9 56 39.54 | 2.2610 | 15 35 13.3 | 14.755 | 15 | 11 38 1.40 | 1.9941 | 2 56 10.4 | 16.221 |
| 16 | 9 58 54.98 | 2.2537 | 15 20 25.8 | 14.828 | 16 | 11 40 0.94 | 1.9907 | 2 39 57.4 | 16.213 |
| 17 | 10 1 9.98 | 2.2463 | 15 5 34.0 | 14.899 | 17 | 11 42 0.28 | 1.9874 | 2 23 44.8 | 16.205 |
| 18 | 10 3 24.53 | 2.2389 | 14 50 37.9 | 14.969 | 18 | 11 43 59.43 | 1.9841 | 2 7 32.8 | 16.194 |
| 19 | 10 5 38.65 | 2.2318 | 14 35 37.7 | 15.036 | 19 | 11 45 58.38 | 1.9808 | 1 51 21.5 | 16.182 |
| 20 | 10 7 52.35 | 2.2248 | 14 20 33.6 | 15.100 | 20 | 11 47 57.13 | 1.9777 | 1 35 10.9 | 16.170 |
| 21 | 10 10 5.63 | 2.2178 | 14 5 25.7 | 15.162 | 21 | 11 49 55.70 | 1.9747 | 1 19 1.1 | 16.156 |
| 22 | 10 12 18.49 | 2.2107 | 13 50 14.1 | 15.224 | 22 | 11 51 54.09 | 1.9717 | 1 2 52.2 | 16.141 |
| 23 | 10 14 30.92 | 2.2037 | N.13 34 58.8 | 15.284 | 23 | 11 53 52.31 | 1.9689 | N. 0 46 44.2 | 16.124 |
| | THURSDAY 10. | | | | | SATURDAY 12. | | | |
| 0 | 10 16 42.94 | 2.1969 | N.13 19 40.0 | 15.342 | 0 | 11 55 50.36 | 1.9662 | N. 0 30 37.3 | 16.106 |
| 1 | 10 18 54.55 | 2.1902 | 13 4 17.8 | 15.397 | 1 | 11 57 48.25 | 1.9635 | N. 0 14 31.5 | 16.087 |
| 2 | 10 21 5.76 | 2.1836 | 12 48 52.4 | 15.449 | 2 | 11 59 45.98 | 1.9608 | S. 0 1 33.1 | 16.067 |
| 3 | 10 23 16.58 | 2.1770 | 12 33 23.9 | 15.500 | 3 | 12 1 43.55 | 1.9582 | 0 17 36.5 | 16.046 |
| 4 | 10 25 27.00 | 2.1704 | 12 17 52.4 | 15.550 | 4 | 12 3 40.97 | 1.9558 | 0 33 38.6 | 16.022 |
| 5 | 10 27 37.03 | 2.1640 | 12 2 17.9 | 15.598 | 5 | 12 5 38.25 | 1.9536 | 0 49 39.2 | 15.998 |
| 6 | 10 29 46.68 | 2.1577 | 11 46 40.6 | 15.644 | 6 | 12 7 35.40 | 1.9514 | 1 5 38.4 | 15.974 |
| 7 | 10 31 55.95 | 2.1513 | 11 31 0.6 | 15.687 | 7 | 12 9 32.42 | 1.9492 | 1 21 36.1 | 15.948 |
| 8 | 10 34 4.84 | 2.1450 | 11 15 18.1 | 15.729 | 8 | 12 11 29.30 | 1.9470 | 1 37 32.2 | 15.921 |
| 9 | 10 36 13.35 | 2.1388 | 10 59 33.1 | 15.770 | 9 | 12 13 26.06 | 1.9450 | 1 53 26.6 | 15.892 |
| 10 | 10 38 21.50 | 2.1328 | 10 43 45.7 | 15.809 | 10 | 12 15 22.70 | 1.9431 | 2 9 19.3 | 15.863 |
| 11 | 10 40 29.29 | 2.1268 | 10 27 56.0 | 15.846 | 11 | 12 17 19.23 | 1.9413 | 2 25 10.2 | 15.833 |
| 12 | 10 42 36.72 | 2.1209 | 10 12 4.2 | 15.880 | 12 | 12 19 15.66 | 1.9396 | 2 40 59.3 | 15.802 |
| 13 | 10 44 43.80 | 2.1151 | 9 56 10.4 | 15.913 | 13 | 12 21 11.99 | 1.9379 | 2 56 46.5 | 15.769 |
| 14 | 10 46 50.54 | 2.1094 | 9 40 14.6 | 15.946 | 14 | 12 23 8.21 | 1.9362 | 3 12 31.6 | 15.735 |
| 15 | 10 48 56.93 | 2.1037 | 9 24 16.9 | 15.976 | 15 | 12 25 4.34 | 1.9347 | 3 28 14.7 | 15.701 |
| 16 | 10 51 2.99 | 2.0982 | 9 8 17.5 | 16.004 | 16 | 12 27 0.38 | 1.9333 | 3 43 55.7 | 15.665 |
| 17 | 10 53 8.72 | 2.0927 | 8 52 16.4 | 16.031 | 17 | 12 28 56.34 | 1.9320 | 3 59 34.5 | 15.628 |
| 18 | 10 55 14.11 | 2.0872 | 8 36 13.8 | 16.055 | 18 | 12 30 52.22 | 1.9308 | 4 15 11.1 | 15.591 |
| 19 | 10 57 19.18 | 2.0819 | 8 20 9.8 | 16.078 | 19 | 12 32 48.03 | 1.9296 | 4 30 45.4 | 15.552 |
| 20 | 10 59 23.94 | 2.0768 | 8 4 4.4 | 16.101 | 20 | 12 34 43.77 | 1.9284 | 4 46 17.3 | 15.512 |
| 21 | 11 1 28.40 | 2.0717 | 7 47 57.7 | 16.121 | 21 | 12 36 39.44 | 1.9273 | 5 1 46.9 | 15.472 |
| 22 | 11 3 32.55 | 2.0667 | 7 31 49.9 | 16.138 | 22 | 12 38 35.05 | 1.9264 | 5 17 14.0 | 15.430 |
| 23 | 11 5 36.40 | 2.0617 | 7 15 41.1 | 16.155 | 23 | 12 40 30.61 | 1.9257 | 5 32 38.5 | 15.387 |
| 24 | 11 7 39.95 | 2.0568 | N. 6 59 31.3 | 16.171 | 24 | 12 42 26.13 | 1.9249 | S. 5 48 0.5 | 15.344 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | | SUNDAY 13. | | |
| | h m s | s | ° ′ ″ | ″ |
| 0 | 12 42 26.13 | 1.9249 | S. 5 48 0.5 | 15.344 |
| 1 | 12 44 21.60 | 1.9242 | 6 3 19.8 | 15.299 |
| 2 | 12 46 17.03 | 1.9235 | 6 18 36.4 | 15.254 |
| 3 | 12 48 12.42 | 1.9229 | 6 33 50.3 | 15.208 |
| 4 | 12 50 7.78 | 1.9224 | 6 49 1.4 | 15.161 |
| 5 | 12 52 3.11 | 1.9220 | 7 4 9.6 | 15.112 |
| 6 | 12 53 58.42 | 1.9217 | 7 19 14.8 | 15.062 |
| 7 | 12 55 53.71 | 1.9214 | 7 34 17.0 | 15.013 |
| 8 | 12 57 48.99 | 1.9213 | 7 49 16.3 | 14.963 |
| 9 | 12 59 44.27 | 1.9212 | 8 4 12.6 | 14.912 |
| 10 | 13 1 39.54 | 1.9212 | 8 19 5.7 | 14.858 |
| 11 | 13 3 34.81 | 1.9212 | 8 33 55.5 | 14.803 |
| 12 | 13 5 30.08 | 1.9213 | 8 48 42.1 | 14.749 |
| 13 | 13 7 25.36 | 1.9215 | 9 3 25.4 | 14.694 |
| 14 | 13 9 20.66 | 1.9217 | 9 18 5.4 | 14.638 |
| 15 | 13 11 15.97 | 1.9220 | 9 32 42.0 | 14.582 |
| 16 | 13 13 11.30 | 1.9224 | 9 47 15.2 | 14.524 |
| 17 | 13 15 6.66 | 1.9230 | 10 1 44.9 | 14.465 |
| 18 | 13 17 2.06 | 1.9236 | 10 16 11.0 | 14.405 |
| 19 | 13 18 57 49 | 1.9242 | 10 30 33.5 | 14.345 |
| 20 | 13 20 52.96 | 1.9248 | 10 44 52.4 | 14.284 |
| 21 | 13 22 48.46 | 1.9254 | 10 59 7.6 | 14.222 |
| 22 | 13 24 44.01 | 1.9263 | 11 13 19.1 | 14.159 |
| 23 | 13 26 39.62 | 1.9872 | S. 11 27 26.7 | 14.095 |
| | | MONDAY 14. | | |
| 0 | 13 28 35.28 | 1.9282 | S. 11 41 30.5 | 14.031 |
| 1 | 13 30 31.00 | 1.9292 | 11 55 30.4 | 13.966 |
| 2 | 13 32 26.78 | 1.9302 | 12 9 26.4 | 13.901 |
| 3 | 13 34 22.62 | 1.9313 | 12 23 18.5 | 13.834 |
| 4 | 13 36 18.53 | 1.9325 | 12 37 6.5 | 13.766 |
| 5 | 13 38 14.52 | 1.9338 | 12 50 50.4 | 13.697 |
| 6 | 13 40 10.59 | 1.9352 | 13 4 30.2 | 13.628 |
| 7 | 13 42 6.74 | 1.9365 | 13 18 5.8 | 13.558 |
| 8 | 13 44 2.97 | 1.9379 | 13 31 37.2 | 13.488 |
| 9 | 13 45 59.29 | 1.9394 | 13 45 4.4 | 13.417 |
| 10 | 13 47 55.70 | 1.9410 | 13 58 27.3 | 13.345 |
| 11 | 13 49 52.21 | 1.9426 | 14 11 45.8 | 13.272 |
| 12 | 13 51 48.82 | 1.9443 | 14 25 0.0 | 13.199 |
| 13 | 13 53 45.53 | 1.9461 | 14 38 9.7 | 13.125 |
| 14 | 13 55 42.35 | 1.9479 | 14 51 14.9 | 13.049 |
| 15 | 13 57 39.28 | 1.9498 | 15 4 15.6 | 12.973 |
| 16 | 13 59 36.32 | 1.9517 | 15 17 11.7 | 12.897 |
| 17 | 14 1 33.48 | 1.9536 | 15 30 3.2 | 12.820 |
| 18 | 14 3 30.75 | 1.9555 | 15 42 50.1 | 12.742 |
| 19 | 14 5 28.14 | 1.9576 | 15 55 32.3 | 12.663 |
| 20 | 14 7 25.66 | 1.9598 | 16 8 9.7 | 12.583 |
| 21 | 14 9 23.32 | 1.9621 | 16 20 42.2 | 12.502 |
| 22 | 14 11 21.11 | 1.9642 | 16 33 9.9 | 12.422 |
| 23 | 14 13 19.03 | 1.9664 | 16 45 32.8 | 12.341 |
| 24 | 14 15 17.08 | 1.9687 | S. 16 57 50.8 | 12.258 |

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | | TUESDAY 15. | | |
| | h m s | s | ° ′ ″ | ″ |
| 0 | 14 15 17.08 | 1.9687 | S. 16 57 50.8 | 12.258 |
| 1 | 14 17 15.27 | 1.9711 | 17 10 3.8 | 12.175 |
| 2 | 14 19 13.61 | 1.9737 | 17 22 11.8 | 12.091 |
| 3 | 14 21 12.11 | 1.9762 | 17 34 14.7 | 12.006 |
| 4 | 14 23 10.75 | 1.9786 | 17 46 12.5 | 11.921 |
| 5 | 14 25 9.54 | 1.9810 | 17 58 5.2 | 11.835 |
| 6 | 14 27 8.47 | 1.9835 | 18 9 52.7 | 11.748 |
| 7 | 14 29 7.56 | 1.9862 | 18 21 35.0 | 11.661 |
| 8 | 14 31 6.82 | 1.9890 | 18 33 12.0 | 11.572 |
| 9 | 14 33 6.24 | 1.9917 | 18 44 43.7 | 11.483 |
| 10 | 14 35 5.82 | 1.9944 | 18 56 10.0 | 11.394 |
| 11 | 14 37 5.57 | 1.9972 | 19 7 31.0 | 11.304 |
| 12 | 14 39 5.49 | 2.0001 | 19 18 46.5 | 11 213 |
| 13 | 14 41 5.58 | 2.0029 | 19 29 56.5 | 11.121 |
| 14 | 14 43 5.84 | 2.0058 | 19 41 1.0 | 11.029 |
| 15 | 14 45 6.28 | 2.0088 | 19 52 0.0 | 10.937 |
| 16 | 14 47 6.90 | 2.0117 | 20 2 53.4 | 10.843 |
| 17 | 14 49 7.69 | 2.0147 | 20 13 41.1 | 10.748 |
| 18 | 14 51 8.66 | 2.0177 | 20 24 23.1 | 10.653 |
| 19 | 14 53 9.82 | 2.0208 | 20 34 59.4 | 10.557 |
| 20 | 14 55 11.16 | 2.0239 | 20 45 29.9 | 10.460 |
| 21 | 14 57 12.69 | 2.0271 | 20 55 54.6 | 10.362 |
| 22 | 14 59 14.41 | 2.0302 | 21 6 13.4 | 10.264 |
| 23 | 15 1 16.32 | 2.0333 | S. 21 16 26.3 | 10.167 |
| | | WEDNESDAY 16. | | |
| 0 | 15 3 18.41 | 2.0365 | S. 21 26 33.4 | 10.068 |
| 1 | 15 5 20.70 | 2.0397 | 21 36 34.5 | 9.967 |
| 2 | 15 7 23.18 | 2.0430 | 21 46 29.5 | 9.866 |
| 3 | 15 9 25.86 | 2.0463 | 21 56 18.4 | 9.764 |
| 4 | 15 11 28.74 | 2.0496 | 22 6 1.2 | 9.663 |
| 5 | 15 13 31.81 | 2.0529 | 22 15 37.9 | 9.561 |
| 6 | 15 15 35.08 | 2.0562 | 22 25 8.5 | 9.458 |
| 7 | 15 17 38.55 | 2.0595 | 22 34 32.9 | 9.353 |
| 8 | 15 19 42.22 | 2.0629 | 22 43 50.9 | 9.248 |
| 9 | 15 21 46.10 | 2.0663 | 22 53 2.6 | 9.143 |
| 10 | 15 23 50.18 | 2.0696 | 23 2 8.0 | 9.037 |
| 11 | 15 25 54.46 | 2.0729 | 23 11 7.0 | 8.930 |
| 12 | 15 27 58.93 | 2.0763 | 23 19 59.6 | 8.822 |
| 13 | 15 30 3.61 | 2.0798 | 23 28 45.7 | 8.714 |
| 14 | 15 32 8.50 | 2.0832 | 23 37 25.3 | 8.606 |
| 15 | 15 34 13.59 | 2.0865 | 23 45 58.4 | 8.497 |
| 16 | 15 36 18.88 | 2.0899 | 23 54 24.9 | 8.387 |
| 17 | 15 38 24.38 | 2.0934 | 24 2 44.8 | 8.276 |
| 18 | 15 40 30.09 | 2.0968 | 24 10 58.0 | 8.164 |
| 19 | 15 42 36.00 | 2.1002 | 24 19 4.5 | 8.052 |
| 20 | 15 44 42.11 | 2.1036 | 24 27 4.2 | 7.939 |
| 21 | 15 46 48.43 | 2.1070 | 24 34 57.2 | 7.826 |
| 22 | 15 48 54.95 | 2.1104 | 24 42 43.4 | 7.712 |
| 23 | 15 51 1.68 | 2.1138 | 24 50 22.7 | 7.597 |
| 24 | 15 53 8.61 | 2.1172 | S. 24 57 55.1 | 7.482 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| THURSDAY 17. | | | | | SATURDAY 19. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 15 53 8.61 | 2.1172 | S.24 57 55.1 | 7.482 | 0 | 17 38 9.14 | 2.2413 | S.28 33 39.8 | 1.324 |
| 1 | 15 55 15.74 | 2.1205 | 25 5 20.6 | 7.367 | 1 | 17 40 23.66 | 2.2426 | 28 34 55.1 | 1.186 |
| 2 | 15 57 23.07 | 2.1239 | 25 12 39.1 | 7.250 | 2 | 17 42 38.25 | 2.2437 | 28 36 2.1 | 1.048 |
| 3 | 15 59 30.61 | 2.1273 | 25 19 50.6 | 7.133 | 3 | 17 44 52.90 | 2.2447 | 28 37 0.9 | 0.910 |
| 4 | 16 1 38.35 | 2.1306 | 25 26 55.1 | 7.016 | 4 | 17 47 7.61 | 2.2458 | 28 37 51.3 | 0.771 |
| 5 | 16 3 46.28 | 2.1339 | 25 33 52.5 | 6.897 | 5 | 17 49 22.39 | 2.2468 | 28 38 33.4 | 0.632 |
| 6 | 16 5 54.41 | 2.1372 | 25 40 42.8 | 6.778 | 6 | 17 51 37.23 | 2.2477 | 28 39 7.1 | 0.492 |
| 7 | 16 8 2.74 | 2.1405 | 25 47 25.9 | 6.658 | 7 | 17 53 52.12 | 2.2485 | 28 39 32.5 | 0.353 |
| 8 | 16 10 11.27 | 2.1437 | 25 54 1.8 | 6.539 | 8 | 17 56 7.05 | 2.2493 | 28 39 49.5 | 0.214 |
| 9 | 16 12 19.99 | 2.1469 | 26 0 30.6 | 6.419 | 9 | 17 58 22.03 | 2.2500 | 28 39 58.2 | −0.075 |
| 10 | 16 14 28.90 | 2.1502 | 26 6 52.1 | 6.297 | 10 | 18 0 37.05 | 2.2506 | 28 39 58.5 | +0.065 |
| 11 | 16 16 38.01 | 2.1534 | 26 13 6.2 | 6.174 | 11 | 18 2 52.10 | 2.2510 | 28 39 50.4 | 0.204 |
| 12 | 16 18 47.31 | 2.1566 | 26 19 13.0 | 6.052 | 12 | 18 5 7.17 | 2.2514 | 28 39 34.0 | 0.343 |
| 13 | 16 20 56.80 | 2.1597 | 26 25 12.4 | 5.929 | 13 | 18 7 22.26 | 2.2518 | 28 39 9.2 | 0.484 |
| 14 | 16 23 6.48 | 2.1628 | 26 31 4.5 | 5.807 | 14 | 18 9 37.38 | 2.2522 | 28 38 35.9 | 0.625 |
| 15 | 16 25 16.34 | 2.1658 | 26 36 49.2 | 5.683 | 15 | 18 11 52.52 | 2.2524 | 28 37 54.2 | 0.765 |
| 16 | 16 27 26.38 | 2.1688 | 26 42 26.4 | 5.558 | 16 | 18 14 7.67 | 2.2525 | 28 37 4.1 | 0.905 |
| 17 | 16 29 36.60 | 2.1719 | 26 47 56.1 | 5.432 | 17 | 18 16 22.82 | 2.2525 | 28 36 5.6 | 1.044 |
| 18 | 16 31 47.01 | 2.1749 | 26 53 18.2 | 5.305 | 18 | 18 18 37.97 | 2.2524 | 28 34 58.8 | 1.183 |
| 19 | 16 33 57.59 | 2.1778 | 26 58 32.7 | 5.179 | 19 | 18 20 53.11 | 2.2523 | 28 33 43.6 | 1.324 |
| 20 | 16 36 8.35 | 2.1807 | 27 3 39.7 | 5.053 | 20 | 18 23 8.25 | 2.2522 | 28 32 19.9 | 1.465 |
| 21 | 16 38 19.28 | 2.1836 | 27 8 39.1 | 4.926 | 21 | 18 25 23.38 | 2.2520 | 28 30 47.8 | 1.605 |
| 22 | 16 40 30.38 | 2.1864 | 27 13 30.9 | 4.798 | 22 | 18 27 38.49 | 2.2516 | 28 29 7.3 | 1.745 |
| 23 | 16 42 41.65 | 2.1892 | S.27 18 14.9 | 4.669 | 23 | 18 29 53.57 | 2.2512 | S.28 27 18.4 | 1.884 |
| FRIDAY 18. | | | | | SUNDAY 20. | | | | |
| 0 | 16 44 53.09 | 2.1920 | S.27 22 51.2 | 4.541 | 0 | 18 32 8.63 | 2.2507 | S.28 25 21.2 | 2.023 |
| 1 | 16 47 4.69 | 2.1947 | 27 27 19.8 | 4.412 | 1 | 18 34 23.66 | 2.2502 | 28 23 15.6 | 2.163 |
| 2 | 16 49 16.45 | 2.1973 | 27 31 40.6 | 4.282 | 2 | 18 36 38.65 | 2.2495 | 28 21 1.6 | 2.303 |
| 3 | 16 51 28.36 | 2.1998 | 27 35 53.6 | 4.152 | 3 | 18 38 53.60 | 2.2488 | 28 18 39.2 | 2.442 |
| 4 | 16 53 40.43 | 2.2024 | 27 39 58.8 | 4.021 | 4 | 18 41 8.51 | 2.2481 | 28 16 8.5 | 2.582 |
| 5 | 16 55 52.65 | 2.2049 | 27 43 56.1 | 3.889 | 5 | 18 43 23.37 | 2.2472 | 28 13 29.4 | 2.722 |
| 6 | 16 58 5.02 | 2.2073 | 27 47 45.5 | 3.758 | 6 | 18 45 38.17 | 2.2462 | 28 10 41.9 | 2.861 |
| 7 | 17 0 17.53 | 2.2098 | 27 51 27.0 | 3.626 | 7 | 18 47 52.91 | 2.2452 | 28 7 46.1 | 2.999 |
| 8 | 17 2 30.19 | 2.2122 | 27 55 0.6 | 3.493 | 8 | 18 50 7.59 | 2.2442 | 28 4 42.0 | 3.137 |
| 9 | 17 4 42.99 | 2.2144 | 27 58 26.2 | 3.360 | 9 | 18 52 22.21 | 2.2431 | 28 1 29.6 | 3.276 |
| 10 | 17 6 55.92 | 2.2166 | 28 1 43.8 | 3.227 | 10 | 18 54 36.76 | 2.2418 | 27 58 8.9 | 3.414 |
| 11 | 17 9 8.98 | 2.2188 | 28 4 53.4 | 3.093 | 11 | 18 56 51.23 | 2.2405 | 27 54 39.9 | 3.552 |
| 12 | 17 11 22.18 | 2.2210 | 28 7 55.0 | 2.959 | 12 | 18 59 5.62 | 2.2392 | 27 51 2.6 | 3.690 |
| 13 | 17 13 35.50 | 2.2230 | 28 10 48.5 | 2.824 | 13 | 19 1 19.93 | 2.2377 | 27 47 17.1 | 3.827 |
| 14 | 17 15 48.94 | 2.2250 | 28 13 33.9 | 2.690 | 14 | 19 3 34.15 | 2.2362 | 27 43 23.3 | 3.965 |
| 15 | 17 18 2.50 | 2.2269 | 28 16 11.3 | 2.556 | 15 | 19 5 48.27 | 2.2346 | 27 39 21.3 | 4.102 |
| 16 | 17 20 16.17 | 2.2287 | 28 18 40.6 | 2.420 | 16 | 19 8 2.30 | 2.2330 | 27 35 11.1 | 4.238 |
| 17 | 17 22 29.95 | 2.2305 | 28 21 1.7 | 2.283 | 17 | 19 10 16.23 | 2.2313 | 27 30 52.7 | 4.374 |
| 18 | 17 24 43.83 | 2.2322 | 28 23 14.6 | 2.147 | 18 | 19 12 30.06 | 2.2296 | 27 26 26.2 | 4.510 |
| 19 | 17 26 57.81 | 2.2339 | 28 25 19.3 | 2.010 | 19 | 19 14 43.78 | 2.2278 | 27 21 51.5 | 4.646 |
| 20 | 17 29 11.90 | 2.2356 | 28 27 15.8 | 1.874 | 20 | 19 16 57.39 | 2.2259 | 27 17 8.7 | 4.782 |
| 21 | 17 31 26.08 | 2.2371 | 28 29 4.2 | 1.737 | 21 | 19 19 10.89 | 2.2240 | 27 12 17.7 | 4.917 |
| 22 | 17 33 40.35 | 2.2385 | 28 30 44.3 | 1.600 | 22 | 19 21 24.27 | 2.2219 | 27 7 18.6 | 5.051 |
| 23 | 17 35 54.70 | 2.2399 | 28 32 16.2 | 1.462 | 23 | 19 23 37.52 | 2.2198 | 27 2 11.6 | 5.184 |
| 24 | 17 38 9.14 | 2.2413 | S.28 33 39.8 | 1.324 | 24 | 19 25 50.65 | 2.2177 | S.26 56 56.6 | 5.318 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| MONDAY 21. | | | | | WEDNESDAY 23. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 19 25 50.65 | 2.2177 | S.26 56 56.6 | 5.318 | 0 | 21 9 4.98 | 2.0752 | S.20 18 21.0 | 11.028 |
| 1 | 19 28 3.65 | 2.2156 | 26 51 33.5 | 5.452 | 1 | 21 11 9.39 | 2.0719 | 20 7 16.3 | 11.128 |
| 2 | 19 30 16.52 | 2.2134 | 26 46 2.4 | 5.584 | 2 | 21 13 13.61 | 2.0687 | 19 56 5.6 | 11.228 |
| 3 | 19 32 29.25 | 2.2111 | 26 40 23.4 | 5.716 | 3 | 21 15 17.63 | 2.0654 | 19 44 49.0 | 11.326 |
| 4 | 19 34 41.85 | 2.2087 | 26 34 36.5 | 5.848 | 4 | 21 17 21.46 | 2.0622 | 19 33 26.5 | 11.423 |
| 5 | 19 36 54.30 | 2.2063 | 26 28 41.7 | 5.980 | 5 | 21 19 25.10 | 2.0592 | 19 21 58.2 | 11.521 |
| 6 | 19 39 6.61 | 2.2039 | 26 22 38.9 | 6.111 | 6 | 21 21 28.56 | 2.0561 | 19 10 24.0 | 11.617 |
| 7 | 19 41 18.77 | 2.2014 | 26 16 28.3 | 6.241 | 7 | 21 23 31.83 | 2.0529 | 18 58 44.1 | 11.712 |
| 8 | 19 43 30.78 | 2.1989 | 26 10 10.0 | 6.370 | 8 | 21 25 34.91 | 2.0497 | 18 46 58.6 | 11.806 |
| 9 | 19 45 42.64 | 2.1963 | 26 3 43.9 | 6.500 | 9 | 21 27 37.79 | 2.0465 | 18 35 7.4 | 11.900 |
| 10 | 19 47 54.34 | 2.1937 | 25 57 10.0 | 6.629 | 10 | 21 29 40.49 | 2.0435 | 18 23 10.6 | 11.992 |
| 11 | 19 50 5.88 | 2.1909 | 25 50 28.4 | 6.757 | 11 | 21 31 43.01 | 2.0406 | 18 11 8.3 | 12.083 |
| 12 | 19 52 17.25 | 2.1882 | 25 43 39.1 | 6.885 | 12 | 21 33 45.36 | 2.0376 | 17 59 0.6 | 12.173 |
| 13 | 19 54 28.46 | 2.1855 | 25 36 42.2 | 7.012 | 13 | 21 35 47.52 | 2.0345 | 17 46 47.5 | 12.263 |
| 14 | 19 56 39.51 | 2.1827 | 25 29 37.7 | 7.139 | 14 | 21 37 49.50 | 2.0316 | 17 34 29.0 | 12.352 |
| 15 | 19 58 50.39 | 2.1799 | 25 22 25.5 | 7.266 | 15 | 21 39 51.31 | 2.0287 | 17 22 5.2 | 12.440 |
| 16 | 20 1 1.10 | 2.1771 | 25 15 5.8 | 7.390 | 16 | 21 41 52.94 | 2.0258 | 17 9 36.2 | 12.527 |
| 17 | 20 3 11.64 | 2.1742 | 25 7 38.7 | 7.514 | 17 | 21 43 54.40 | 2.0229 | 16 57 2.0 | 12.613 |
| 18 | 20 5 22.00 | 2.1712 | 25 0 4.1 | 7.638 | 18 | 21 45 55.69 | 2.0201 | 16 44 22.7 | 12.698 |
| 19 | 20 7 32.18 | 2.1683 | 24 52 22.1 | 7.762 | 19 | 21 47 56.81 | 2.0173 | 16 31 38.3 | 12.782 |
| 20 | 20 9 42.19 | 2.1653 | 24 44 32.7 | 7.885 | 20 | 21 49 57.76 | 2.0145 | 16 18 48.9 | 12.864 |
| 21 | 20 11 52.02 | 2.1622 | 24 36 35.9 | 8.007 | 21 | 21 51 58.55 | 2.0118 | 16 5 54.6 | 12.946 |
| 22 | 20 14 1.66 | 2.1592 | 24 28 31.8 | 8.129 | 22 | 21 53 59.18 | 2.0091 | 15 52 55.4 | 13.027 |
| 23 | 20 16 11.12 | 2.1561 | S.24 20 20.4 | 8.250 | 23 | 21 55 59.65 | 2.0064 | S.15 39 51.4 | 13.107 |
| TUESDAY 22. | | | | | THURSDAY 24. | | | | |
| 0 | 20 18 20.39 | 2.1529 | S.24 12 1.8 | 8.370 | 0 | 21 57 59.95 | 2.0037 | S.15 26 42.5 | 13.187 |
| 1 | 20 20 29.47 | 2.1498 | 24 3 36.0 | 8.489 | 1 | 22 0 0.10 | 2.0012 | 15 13 28.9 | 13.265 |
| 2 | 20 22 38.37 | 2.1467 | 23 55 3.1 | 8.608 | 2 | 22 2 0.10 | 1.9987 | 15 0 10.7 | 13.341 |
| 3 | 20 24 47.08 | 2.1436 | 23 46 23.0 | 8.726 | 3 | 22 3 59.95 | 1.9962 | 14 46 48.0 | 13.417 |
| 4 | 20 26 55.60 | 2.1404 | 23 37 35.9 | 8.843 | 4 | 22 5 59.65 | 1.9937 | 14 33 20.7 | 13.492 |
| 5 | 20 29 3.93 | 2.1372 | 23 28 41.8 | 8.960 | 5 | 22 7 59.20 | 1.9913 | 14 19 48.9 | 13.567 |
| 6 | 20 31 12.06 | 2.1339 | 23 19 40.7 | 9.076 | 6 | 22 9 58.61 | 1.9890 | 14 6 12.7 | 13.640 |
| 7 | 20 33 20.00 | 2.1307 | 23 10 32.7 | 9.191 | 7 | 22 11 57.88 | 1.9867 | 13 52 32.1 | 13.712 |
| 8 | 20 35 27.74 | 2.1274 | 23 1 17.8 | 9.306 | 8 | 22 13 57.01 | 1.9844 | 13 38 47.3 | 13.783 |
| 9 | 20 37 35.29 | 2.1242 | 22 51 56.0 | 9.420 | 9 | 22 15 56.01 | 1.9822 | 13 24 58.2 | 13.853 |
| 10 | 20 39 42.65 | 2.1210 | 22 42 27.4 | 9.532 | 10 | 22 17 54.88 | 1.9801 | 13 11 4.9 | 13.922 |
| 11 | 20 41 49.81 | 2.1177 | 22 32 52.1 | 9.644 | 11 | 22 19 53.62 | 1.9779 | 12 57 7.5 | 13.990 |
| 12 | 20 43 56.77 | 2.1144 | 22 23 10.1 | 9.756 | 12 | 22 21 52.23 | 1.9758 | 12 43 6.1 | 14.057 |
| 13 | 20 46 3.53 | 2.1111 | 22 13 21.4 | 9.867 | 13 | 22 23 50.72 | 1.9738 | 12 29 0.7 | 14.123 |
| 14 | 20 48 10.10 | 2.1079 | 22 3 26.1 | 9.976 | 14 | 22 25 49.09 | 1.9718 | 12 14 51.4 | 14.188 |
| 15 | 20 50 16.48 | 2.1046 | 21 53 24.3 | 10.084 | 15 | 22 27 47.34 | 1.9699 | 12 0 38.2 | 14.252 |
| 16 | 20 52 22.66 | 2.1013 | 21 43 16.0 | 10.192 | 16 | 22 29 45.48 | 1.9681 | 11 46 21.2 | 14.314 |
| 17 | 20 54 28.64 | 2.0980 | 21 33 1.2 | 10.300 | 17 | 22 31 43.51 | 1.9663 | 11 32 0.5 | 14.376 |
| 18 | 20 56 34.42 | 2.0947 | 21 22 40.0 | 10.407 | 18 | 22 33 41.43 | 1.9645 | 11 17 36.0 | 14.438 |
| 19 | 20 58 40.00 | 2.0914 | 21 12 12.4 | 10.512 | 19 | 22 35 39.25 | 1.9628 | 11 3 7.9 | 14.498 |
| 20 | 21 0 45.39 | 2.0882 | 21 1 38.6 | 10.616 | 20 | 22 37 36.97 | 1.9612 | 10 48 35.3 | 14.555 |
| 21 | 21 2 50.58 | 2.0849 | 20 50 58.5 | 10.720 | 21 | 22 39 34.59 | 1.9596 | 10 34 1.3 | 14.612 |
| 22 | 21 4 55.57 | 2.0816 | 20 40 12.2 | 10.823 | 22 | 22 41 32.12 | 1.9581 | 10 19 22.8 | 14.669 |
| 23 | 21 7 0.37 | 2.0784 | 20 29 19.7 | 10.926 | 23 | 22 43 29.56 | 1.9566 | 10 4 41.0 | 14.725 |
| 24 | 21 9 4.98 | 2.0752 | S.20 18 21.0 | 11.028 | 24 | 22 45 26.91 | 1.9552 | S. 9 49 55.8 | 14.780 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### FRIDAY 25.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 22 45 26.91 | 1.9552 | S. 9 49 55.8 | 14.780 |
| 1 | 22 47 24.18 | 1.9538 | 9 35 7.4 | 14.833 |
| 2 | 22 49 21.37 | 1.9525 | 9 20 15.9 | 14.885 |
| 3 | 22 51 18.48 | 1.9513 | 9 5 21.2 | 14.937 |
| 4 | 22 53 15.52 | 1.9502 | 8 50 23.5 | 14.987 |
| 5 | 22 55 12.50 | 1.9491 | 8 35 22.8 | 15.036 |
| 6 | 22 57 9.41 | 1.9480 | 8 20 19.2 | 15.084 |
| 7 | 22 59 6.26 | 1.9470 | 8 5 12.7 | 15.131 |
| 8 | 23 1 3.05 | 1.9461 | 7 50 3.5 | 15.176 |
| 9 | 23 2 59.79 | 1.9452 | 7 34 51.6 | 15.221 |
| 10 | 23 4 56.48 | 1.9444 | 7 19 37.0 | 15.264 |
| 11 | 23 6 53.12 | 1.9437 | 7 4 19.9 | 15.307 |
| 12 | 23 8 49.72 | 1.9430 | 6 49 0.2 | 15.349 |
| 13 | 23 10 46.28 | 1.9424 | 6 33 38.0 | 15.389 |
| 14 | 23 12 42.81 | 1.9420 | 6 18 13.5 | 15.428 |
| 15 | 23 14 39.32 | 1.9416 | 6 2 46.7 | 15.466 |
| 16 | 23 16 35.80 | 1.9412 | 5 47 17.6 | 15.502 |
| 17 | 23 18 32.26 | 1.9408 | 5 31 46.4 | 15.538 |
| 18 | 23 20 28.70 | 1.9406 | 5 16 13.0 | 15.573 |
| 19 | 23 22 25.13 | 1.9404 | 5 0 37.6 | 15.607 |
| 20 | 23 24 21.55 | 1.9403 | 4 45 0.2 | 15.639 |
| 21 | 23 26 17.97 | 1.9403 | 4 29 20.9 | 15.670 |
| 22 | 23 28 14.39 | 1.9403 | 4 13 39.8 | 15.700 |
| 23 | 23 30 10.81 | 1.9404 | S. 3 57 56.9 | 15.729 |

### SATURDAY 26.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 23 32 7.24 | 1.9406 | S. 3 42 12.3 | 15.757 |
| 1 | 23 34 3.68 | 1.9408 | 3 26 26.1 | 15.783 |
| 2 | 23 36 0.14 | 1.9412 | 3 10 38.3 | 15.809 |
| 3 | 23 37 56.63 | 1.9417 | 2 54 49.0 | 15.833 |
| 4 | 23 39 53.15 | 1.9421 | 2 38 58.3 | 15.857 |
| 5 | 23 41 49.69 | 1.9426 | 2 23 6.2 | 15.879 |
| 6 | 23 43 46.26 | 1.9432 | 2 7 12.8 | 15.900 |
| 7 | 23 45 42.87 | 1.9439 | 1 51 18.2 | 15.919 |
| 8 | 23 47 39.53 | 1.9448 | 1 35 22.5 | 15.937 |
| 9 | 23 49 36.25 | 1.9457 | 1 19 25.7 | 15.955 |
| 10 | 23 51 33.02 | 1.9466 | 1 3 27.9 | 15.971 |
| 11 | 23 53 29.84 | 1.9474 | 0 47 29.2 | 15.986 |
| 12 | 23 55 26.71 | 1.9484 | 0 31 29.6 | 16.000 |
| 13 | 23 57 23.65 | 1.9497 | S. 0 15 29.2 | 16.012 |
| 14 | 23 59 20.67 | 1.9511 | N. 0 0 31.9 | 16.023 |
| 15 | 0 1 17.78 | 1.9525 | 0 16 33.6 | 16.033 |
| 16 | 0 3 14.97 | 1.9538 | 0 32 35.9 | 16.042 |
| 17 | 0 5 12.24 | 1.9552 | 0 48 38.7 | 16.049 |
| 18 | 0 7 9.59 | 1.9567 | 1 4 41.8 | 16.055 |
| 19 | 0 9 7.04 | 1.9584 | 1 20 45.3 | 16.061 |
| 20 | 0 11 4.60 | 1.9602 | 1 36 49.1 | 16.065 |
| 21 | 0 13 2.26 | 1.9619 | 1 52 53.1 | 16.067 |
| 22 | 0 15 0.03 | 1.9637 | 2 8 57.2 | 16.069 |
| 23 | 0 16 57.91 | 1.9657 | 2 25 1.4 | 16.069 |
| 24 | 0 18 55.91 | 1.9677 | N. 2 41 5.5 | 16.068 |

### SUNDAY 27.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 0 18 55.91 | 1.9677 | N. 2 41 5.5 | 16.068 |
| 1 | 0 20 54.03 | 1.9698 | 2 57 9.5 | 16.066 |
| 2 | 0 22 52,29 | 1.9721 | 3 13 13.4 | 16.062 |
| 3 | 0 24 50.68 | 1.9744 | 3 29 17.0 | 16.057 |
| 4 | 0 26 49.21 | 1.9768 | 3 45 20.3 | 16.051 |
| 5 | 0 28 47.89 | 1.9792 | 4 1 23.1 | 16.043 |
| 6 | 0 30 46.71 | 1.9816 | 4 17 25.4 | 16.034 |
| 7 | 0 32 45.68 | 1.9843 | 4 33 27.2 | 16.024 |
| 8 | 0 34 44.82 | 1.9870 | 4 49 28.3 | 16.012 |
| 9 | 0 36 44.12 | 1.9898 | 5 5 28.7 | 16.000 |
| 10 | 0 38 43.59 | 1.9926 | 5 21 28.3 | 15.966 |
| 11 | 0 40 43.23 | 1.9955 | 5 37 27.0 | 15.970 |
| 12 | 0 42 43.05 | 1.9985 | 5 53 24.7 | 15.953 |
| 13 | 0 44 43.05 | 2.0016 | 6 9 21.4 | 15.936 |
| 14 | 0 46 43.24 | 2.0048 | 6 25 17.0 | 15.917 |
| 15 | 0 48 43.62 | 2.0080 | 6 41 11.4 | 15.896 |
| 16 | 0 50 44.20 | 2.0113 | 6 57 4.5 | 15.873 |
| 17 | 0 52 44.98 | 2.0147 | 7 12 56.2 | 15.849 |
| 18 | 0 54 45.97 | 2.0182 | 7 28 46.4 | 15.824 |
| 19 | 0 56 47.17 | 2.0218 | 7 44 35.1 | 15.798 |
| 20 | 0 58 48.59 | 2.0255 | 8 0 22.2 | 15.771 |
| 21 | 1 0 50.23 | 2.0293 | 8 16 7.6 | 15.742 |
| 22 | 1 2 52.10 | 2.0331 | 8 31 51.2 | 15.711 |
| 23 | 1 4 54.20 | 2.0369 | N. 8 47 32.9 | 15.679 |

### MONDAY 28.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 1 6 56.53 | 2.0409 | N. 9 3 12.7 | 15.647 |
| 1 | 1 8 59.11 | 2.0451 | 9 18 50.5 | 15.612 |
| 2 | 1 11 1.94 | 2.0492 | 9 34 26.1 | 15.575 |
| 3 | 1 13 5.01 | 2.0534 | 9 49 59.5 | 15.537 |
| 4 | 1 15 8.34 | 2.0578 | 10 5 30.6 | 15.498 |
| 5 | 1 17 11.94 | 2.0622 | 10 20 59.3 | 15.458 |
| 6 | 1 19 15.80 | 2.0666 | 10 36 25.6 | 15.417 |
| 7 | 1 21 19,93 | 2.0712 | 10 51 49.3 | 15.373 |
| 8 | 1 23 24.34 | 2.0758 | 11 7 10.3 | 15.327 |
| 9 | 1 25 29.03 | 2.0805 | 11 22 28.6 | 15.221 |
| 10 | 1 27 34.00 | 2.0853 | 11 37 44.0 | 15.233 |
| 11 | 1 29 39.26 | 2.0902 | 11 52 56.6 | 15.185 |
| 12 | 1 31 44.82 | 2.0952 | 12 8 6.2 | 15.134 |
| 13 | 1 33 50.68 | 2.1002 | 12 23 12.7 | 15.081 |
| 14 | 1 35 56.84 | 2.1052 | 12 38 15.9 | 15.027 |
| 15 | 1 38 3.30 | 2.1103 | 12 53 15.9 | 14.972 |
| 16 | 1 40 10.07 | 2.1156 | 13 8 12.5 | 14.915 |
| 17 | 1 42 17.17 | 2.1210 | 13 23 5.7 | 14.857 |
| 18 | 1 44 24.59 | 2.1264 | 13 37 55.3 | 14.797 |
| 19 | 1 46 32.34 | 2.1318 | 13 52 41.3 | 14.735 |
| 20 | 1 48 40.41 | 2.1372 | 14 7 23.5 | 14.672 |
| 21 | 1 50 48.81 | 2.1428 | 14 22 1.9 | 14.607 |
| 22 | 1 52 57.55 | 2.1486 | 14 36 36.4 | 14.541 |
| 23 | 1 55 6.64 | 2.1544 | 14 51 6.8 | 14.472 |
| 24 | 1 57 16.08 | 2.1602 | N.15 5 33.1 | 11.403 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### TUESDAY 29.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 1 57 16.08 | 2.1602 | N.15 5 33.1 | 14.403 |
| 1 | 1 59 25.87 | 2.1661 | 15 19 55.2 | 14.332 |
| 2 | 2 1 36.01 | 2.1719 | 15 34 13.0 | 14.260 |
| 3 | 2 3 46.50 | 2.1779 | 15 48 26.4 | 14.186 |
| 4 | 2 5 57.36 | 2.1841 | 16 2 35.3 | 14.110 |
| 5 | 2 8 8.59 | 2.1902 | 16 16 39.6 | 14.032 |
| 6 | 2 10 20.18 | 2.1963 | 16 30 39.2 | 13.953 |
| 7 | 2 12 32.15 | 2.2026 | 16 44 34.0 | 13.872 |
| 8 | 2 14 44.50 | 2.2089 | 16 58 23.9 | 13.790 |
| 9 | 2 16 57.22 | 2.2152 | 17 12 8.8 | 13.706 |
| 10 | 2 19 10.33 | 2.2217 | 17 25 48.6 | 13.620 |
| 11 | 2 21 23.83 | 2.2282 | 17 39 23.2 | 13.532 |
| 12 | 2 23 37.72 | 2.2347 | 17 52 52.5 | 13.443 |
| 13 | 2 25 52.00 | 2.2413 | 18 6 16.4 | 13.353 |
| 14 | 2 28 6.68 | 2.2480 | 18 19 34.8 | 13.261 |
| 15 | 2 30 21.76 | 2.2547 | 18 32 47.7 | 13.168 |
| 16 | 2 32 37.24 | 2.2614 | 18 45 54.9 | 13.072 |
| 17 | 2 34 53.13 | 2.2681 | 18 58 56.3 | 12.973 |
| 18. | 2 37 9.42 | 2.2749 | 19 11 51.7 | 12.873 |
| 19 | 2 39 26.12 | 2.2818 | 19 24 41.1 | 12.773 |
| 20 | 2 41 43.24 | 2.2887 | 19 37 24.5 | 12.672 |
| 21 | 2 44 0.77 | 2.2957 | 19 50 1.7 | 12.568 |
| 22 | 2 46 18.72 | 2.3027 | 20 2 32.6 | 12.461 |
| 23 | 2 48 37.09 | 2.3097 | 20 14 57.0 | 12.352 |
| 24 | 2 50 55.88 | 2.3167 | N.20 27 14.8 | 12.242 |

### WEDNESDAY, MARCH 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 2 50 55.88 | 2.3167 | N.20 27 14.8 | 12.242 |

### PHASES OF THE MOON.

| | | d | h | m |
|---|---|---|---|---|
| ☽ | First Quarter,. . . | 2 | 13 | 53.4 |
| ○ | Full Moon,. . . | 9 | 5 | 46.9 |
| ☾ | Last Quarter,. . . | 16 | 16 | 56.0 |
| ● | New Moon, . . . | 24 | 18 | 20.4 |

| | | d | h |
|---|---|---|---|
| ☾ | Perigee,. . . . . . | 6 | 21.2 |
| ☾ | Apogee,. . . . . . | 18 | 15.9 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun | W. | 70° 1′ 22″ | 2845 | 71° 34′ 51″ | 2835 | 73° 8′ 34″ | 2823 | 74° 42′ 32″ | 2812 |
| | Venus | W. | 38 43 28 | 2909 | 40 15 36 | 2898 | 41 47 58 | 2886 | 43 20 35 | 2875 |
| | α Pegasi | W. | 34 23 48 | 3453 | 35 45 5 | 3367 | 37 7 59 | 3291 | 38 32 21 | 3221 |
| | Mars | W. | 10 56 12 | 2747 | 12 31 49 | 2733 | 14 7 45 | 2720 | 15 43 59 | 2708 |
| | Aldebaran | E. | 46 33 9 | 2633 | 44 54 59 | 2632 | 43 16 47 | 2631 | 41 38 34 | 2632 |
| | Pollux | E. | 89 14 44 | 2497 | 87 33 27 | 2487 | 85 51 56 | 2477 | 84 10 11 | 2467 |
| | Regulus | E. | 126 1 23 | 2500 | 124 20 10 | 2490 | 122 38 43 | 2480 | 120 57 1 | 2470 |
| 2 | Sun | W. | 82 36 1 | 2756 | 84 11 27 | 2744 | 85 47 9 | 2732 | 87 23 6 | 2721 |
| | Venus | W. | 51 7 16 | 2818 | 52 41 21 | 2807 | 54 15 40 | 2795 | 55 50 14 | 2784 |
| | α Pegasi | W. | 45 52 25 | 2961 | 47 23 27 | 2921 | 48 55 19 | 2884 | 50 27 58 | 2850 |
| | Mars | W. | 23 49 10 | 2649 | 25 26 59 | 2637 | 27 5 4 | 2626 | 28 43 24 | 2614 |
| | Aldebaran | E. | 33 28 29 | 2663 | 31 51 0 | 2678 | 30 13 51 | 2698 | 28 37 8 | 2723 |
| | Pollux | E. | 75 37 49 | 2416 | 73 54 37 | 2405 | 72 11 10 | 2395 | 70 27 28 | 2385 |
| | Regulus | E. | 112 24 52 | 2417 | 110 41 42 | 2407 | 108 58 17 | 2396 | 107 14 37 | 2386 |
| 3 | Sun | W. | 95 26 35 | 2665 | 97 4 2 | 2654 | 98 41 43 | 2643 | 100 19 39 | 2632 |
| | Venus | W. | 63 46 49 | 2727 | 65 22 53 | 2716 | 66 59 12 | 2704 | 68 35 46 | 2694 |
| | α Pegasi | W. | 58 21 26 | 2708 | 59 57 55 | 2685 | 61 34 55 | 2663 | 63 12 24 | 2642 |
| | Mars | W. | 36 58 56 | 2558 | 38 38 48 | 2548 | 40 18 55 | 2537 | 41 59 17 | 2527 |
| | Pollux | E. | 61 45 17 | 2333 | 60 0 6 | 2324 | 58 14 41 | 2313 | 56 29 1 | 2303 |
| | Regulus | E. | 98 32 31 | 2334 | 96 47 21 | 2324 | 95 1 56 | 2313 | 93 16 16 | 2304 |
| 4 | Sun | W. | 108 32 58 | 2580 | 110 12 20 | 2570 | 111 51 56 | 2561 | 113 31 45 | 2552 |
| | Venus | W. | 76 42 13 | 2640 | 78 20 13 | 2630 | 79 58 27 | 2621 | 81 36 54 | 2611 |
| | α Pegasi | W. | 71 26 28 | 2553 | 73 6 27 | 2538 | 74 46 47 | 2525 | 76 27 26 | 2512 |
| | Mars | W. | 50 24 45 | 2475 | 52 6 34 | 2465 | 53 48 36 | 2455 | 55 30 52 | 2447 |
| | α Arietis | W. | 28 2 6 | 2391 | 29 45 53 | 2368 | 31 30 14 | 2346 | 33 15 6 | 2327 |
| | Pollux | E. | 47 37 7 | 2256 | 45 50 3 | 2247 | 44 2 46 | 2239 | 42 15 16 | 2230 |
| | Regulus | E. | 84 24 20 | 2255 | 82 37 14 | 2246 | 80 49 55 | 2237 | 79 2 23 | 2228 |
| 5 | Sun | W. | 121 53 53 | 2510 | 123 34 53 | 2502 | 125 16 3 | 2496 | 126 57 22 | 2489 |
| | Venus | W. | 89 52 20 | 2566 | 91 32 1 | 2559 | 93 11 52 | 2551 | 94 51 54 | 2545 |
| | α Pegasi | W. | 84 54 54 | 2458 | 86 37 7 | 2450 | 88 19 31 | 2443 | 90 2 5 | 2436 |
| | Mars | W. | 64 5 19 | 2404 | 65 48 48 | 2396 | 67 32 28 | 2389 | 69 16 18 | 2382 |
| | α Arietis | W. | 42 5 40 | 2253 | 43 52 48 | 2241 | 45 40 14 | 2231 | 47 27 55 | 2221 |
| | Pollux | E. | 33 14 45 | 2192 | 31 26 6 | 2186 | 29 37 18 | 2181 | 27 48 21 | 2176 |
| | Regulus | E. | 70 1 31 | 2188 | 68 12 46 | 2181 | 66 23 50 | 2175 | 64 34 44 | 2169 |
| | Spica | E. | 124 1 56 | 2184 | 122 13 5 | 2177 | 120 24 3 | 2170 | 118 34 51 | 2164 |
| 6 | Venus | W. | 103 14 16 | 2516 | 104 55 7 | 2511 | 106 36 5 | 2507 | 108 17 8 | 2504 |
| | α Pegasi | W. | 98 36 47 | 2417 | 100 19 57 | 2417 | 102 3 7 | 2417 | 103 46 17 | 2419 |
| | Mars | W. | 77 57 44 | 2355 | 79 42 24 | 2351 | 81 27 10 | 2347 | 83 12 1 | 2344 |
| | α Arietis | W. | 56 29 41 | 2182 | 58 18 35 | 2177 | 60 7 37 | 2172 | 61 56 47 | 2167 |
| | Aldebaran | W. | 26 51 42 | 2482 | 28 33 21 | 2440 | 30 15 59 | 2405 | 31 59 27 | 2374 |
| | Regulus | E. | 55 27 4 | 2143 | 53 37 10 | 2139 | 51 47 10 | 2136 | 49 57 6 | 2133 |
| | Spica | E. | 109 26 38 | 2138 | 107 36 37 | 2134 | 105 46 29 | 2130 | 103 56 16 | 2128 |
| 7 | Venus | W. | 116 43 17 | 2496 | 118 24 36 | 2497 | 120 5 54 | 2497 | 121 47 11 | 2498 |
| | Mars | W. | 91 57 10 | 2336 | 93 42 17 | 2337 | 95 27 23 | 2337 | 97 12 28 | 2338 |
| | α Arietis | W. | 71 3 58 | 2155 | 72 53 33 | 2155 | 74 43 9 | 2155 | 76 32 45 | 2155 |
| | Aldebaran | W. | 40 45 38 | 2281 | 42 32 5 | 2271 | 44 18 47 | 2262 | 46 5 42 | 2255 |
| | Regulus | E. | 40 45 59 | 2128 | 38 55 43 | 2129 | 37 5 28 | 2130 | 35 15 15 | 2133 |
| | Spica | E. | 94 44 19 | 2120 | 92 53 50 | 2121 | 91 3 22 | 2121 | 89 12 55 | 2122 |
| | Jupiter | E. | 131 50 22 | 2188 | 130 1 36 | 2186 | 128 12 47 | 2185 | 126 23 57 | 2184 |

## GREENWICH MEAN TIME.

### LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun | W. | 76° 16′ 44″ | 2801 | 77° 51′ 11″ | 2789 | 79° 25′ 53″ | 2778 | 81° 0′ 50″ | 2767 |
| | Venus | W. | 44 53 26 | 2863 | 46 26 32 | 2852 | 47 59 52 | 2841 | 49 33 27 | 2830 |
| | α Pegasi | W. | 39 58 5 | 3159 | 41 25 3 | 3103 | 42 53 9 | 3052 | 44 22 18 | 3005 |
| | Mars | W. | 17 20 29 | 2696 | 18 57 15 | 2683 | 20 34 18 | 2672 | 22 11 36 | 2660 |
| | Aldebaran | E. | 40 0 22 | 2634 | 38 22 13 | 2637 | 36 44 9 | 2643 | 35 6 13 | 2652 |
| | Pollux | E. | 82 28 11 | 2457 | 80 45 57 | 2447 | 79 3 29 | 2436 | 77 20 46 | 2426 |
| | Regulus | E. | 119 15 5 | 2459 | 117 32 54 | 2448 | 115 50 28 | 2438 | 114 7 47 | 2428 |
| 2 | Sun | W. | 88 59 18 | 2710 | 90 35 45 | 2699 | 92 12 27 | 2687 | 93 49 24 | 2677 |
| | Venus | W. | 57 25 3 | 2772 | 59 0 7 | 2761 | 60 35 26 | 2750 | 62 11 0 | 2738 |
| | α Pegasi | W. | 52 1 21 | 2818 | 53 35 26 | 2788 | 55 10 10 | 2760 | 56 45 31 | 2734 |
| | Mars | W. | 30 22 0 | 2603 | 32 0 51 | 2591 | 33 39 58 | 2581 | 35 19 19 | 2569 |
| | Aldebaran | E. | 27 0 58 | 2756 | 25 25 32 | 2798 | 23 51 1 | 2852 | 22 17 41 | 2924 |
| | Pollux | E. | 68 43 32 | 2374 | 66 59 20 | 2364 | 65 14 54 | 2354 | 63 30 13 | 2344 |
| | Regulus | E. | 105 30 42 | 2375 | 103 46 32 | 2365 | 102 2 7 | 2354 | 100 17 26 | 2344 |
| 3 | Sun | W. | 101 57 50 | 2621 | 103 36 16 | 2611 | 105 14 56 | 2601 | 106 53 50 | 2591 |
| | Venus | W. | 70 12 34 | 2683 | 71 49 37 | 2672 | 73 26 55 | 2661 | 75 4 27 | 2651 |
| | α Pegasi | W. | 64 50 22 | 2622 | 66 28 47 | 2604 | 68 7 37 | 2586 | 69 46 51 | 2569 |
| | Mars | W. | 43 39 53 | 2516 | 45 20 44 | 2505 | 47 1 50 | 2495 | 48 43 10 | 2485 |
| | Pollux | E. | 54 43 6 | 2293 | 52 56 57 | 2284 | 51 10 34 | 2275 | 49 23 57 | 2266 |
| | Regulus | E. | 91 30 22 | 2294 | 89 44 13 | 2284 | 87 57 50 | 2274 | 86 11 12 | 2264 |
| 4 | Sun | W. | 115 11 46 | 2543 | 116 52 0 | 2534 | 118 32 26 | 2525 | 120 13 4 | 2517 |
| | Venus | W. | 83 15 34 | 2601 | 84 54 27 | 2592 | 86 33 33 | 2583 | 88 12 51 | 2575 |
| | α Pegasi | W. | 78 8 23 | 2499 | 79 49 38 | 2487 | 81 31 9 | 2477 | 83 12 54 | 2467 |
| | Mars | W. | 57 13 20 | 2438 | 58 56 1 | 2429 | 60 38 55 | 2420 | 62 22 1 | 2412 |
| | α Arietis | W. | 35 0 26 | 2310 | 36 46 11 | 2294 | 38 32 20 | 2279 | 40 18 50 | 2266 |
| | Pollux | E. | 40 27 33 | 2222 | 38 39 38 | 2214 | 36 51 32 | 2206 | 35 3 14 | 2199 |
| | Regulus | E. | 77 14 37 | 2220 | 75 26 39 | 2211 | 73 38 28 | 2203 | 71 50 5 | 2196 |
| 5 | Sun | W. | 128 38 51 | 2482 | 130 20 29 | 2477 | 132 2 14 | 2472 | 133 44 6 | 2467 |
| | Venus | W. | 96 32 5 | 2538 | 98 12 25 | 2532 | 99 52 54 | 2526 | 101 33 31 | 2520 |
| | α Pegasi | W. | 91 44 48 | 2431 | 93 27 39 | 2426 | 95 10 37 | 2422 | 96 53 40 | 2419 |
| | Mars | W. | 71 0 18 | 2376 | 72 44 27 | 2370 | 74 28 45 | 2364 | 76 13 11 | 2359 |
| | α Arietis | W. | 49 15 51 | 2212 | 51 4 1 | 2204 | 52 52 23 | 2196 | 54 40 57 | 2189 |
| | Pollux | E. | 25 59 17 | 2171 | 24 10 6 | 2168 | 22 20 50 | 2165 | 20 31 30 | 2163 |
| | Regulus | E. | 62 45 29 | 2163 | 60 56 5 | 2157 | 59 6 32 | 2152 | 57 16 52 | 2147 |
| | Spica | E. | 116 45 30 | 2158 | 114 55 59 | 2153 | 113 6 20 | 2147 | 111 16 33 | 2142 |
| 6 | Venus | W. | 109 58 16 | 2502 | 111 39 27 | 2499 | 113 20 42 | 2497 | 115 1 59 | 2497 |
| | α Pegasi | W. | 105 29 25 | 2422 | 107 12 29 | 2425 | 108 55 28 | 2430 | 110 38 20 | 2437 |
| | Mars | W. | 84 56 57 | 2341 | 86 41 56 | 2339 | 88 26 59 | 2337 | 90 12 4 | 2337 |
| | α Arietis | W. | 63 46 4 | 2163 | 65 35 27 | 2161 | 67 24 54 | 2158 | 69 14 25 | 2157 |
| | Aldebaran | W. | 33 43 39 | 2349 | 35 28 27 | 2328 | 37 13 45 | 2310 | 38 59 30 | 2294 |
| | Regulus | E. | 48 6 57 | 2131 | 46 16 45 | 2130 | 44 26 31 | 2128 | 42 36 15 | 2128 |
| | Spica | E. | 102 5 59 | 2125 | 100 15 38 | 2122 | 98 25 13 | 2122 | 96 34 47 | 2121 |
| 7 | Venus | W. | 123 28 27 | 2500 | 125 9 40 | 2503 | 126 50 49 | 2507 | 128 31 53 | 2510 |
| | Mars | W. | 98 57 32 | 2340 | 100 42 33 | 2343 | 102 27 30 | 2346 | 104 12 22 | 2350 |
| | α Arietis | W. | 78 22 20 | 2157 | 80 11 53 | 2159 | 82 1 23 | 2161 | 83 50 49 | 2165 |
| | Aldebaran | W. | 47 52 48 | 2249 | 49 40 2 | 2245 | 51 27 22 | 2242 | 53 14 47 | 2241 |
| | Regulus | E. | 33 25 6 | 2136 | 31 35 1 | 2140 | 29 45 2 | 2144 | 27 55 10 | 2149 |
| | Spica | E. | 87 22 30 | 2124 | 85 32 8 | 2126 | 83 41 49 | 2130 | 81 51 35 | 2133 |
| | Jupiter | E. | 124 35 6 | 2186 | 122 46 17 | 2186 | 120 57 29 | 2188 | 119 8 44 | 2191 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Mars | W. | 105° 57′ 9″ | 2355 | 107° 41′ 49″ | 2360 | 109° 26′ 22″ | 2365 | 111° 10′ 47″ | 2371 |
| | α Arietis | W. | 85 40 9 | 2169 | 87 29 23 | 2173 | 89 18 31 | 2179 | 91 7 31 | 2185 |
| | Aldebaran | W. | 55 2 14 | 2240 | 56 49 42 | 2241 | 58 37 9 | 2242 | 60 24 34 | 2245 |
| | Spica | E. | 80 1 26 | 2137 | 78 11 24 | 2142 | 76 21 29 | 2147 | 74 31 42 | 2153 |
| | Jupiter | E. | 117 20 3 | 2194 | 115 31 27 | 2198 | 113 42 57 | 2203 | 111 54 34 | 2208 |
| | Antares | E. | 125 55 21 | 2137 | 124 5 19 | 2142 | 122 15 24 | 2147 | 120 25 37 | 2153 |
| 9 | α Arietis | W. | 100 9 54 | 2224 | 101 57 46 | 2234 | 103 45 23 | 2244 | 105 32 45 | 2255 |
| | Aldebaran | W. | 69 20 14 | 2270 | 71 6 57 | 2278 | 72 53 28 | 2287 | 74 39 47 | 2296 |
| | Pollux | W. | 25 28 47 | 2203 | 27 17 10 | 2212 | 29 5 20 | 2220 | 30 53 17 | 2229 |
| | Spica | E. | 65 25 19 | 2192 | 63 36 39 | 2200 | 61 48 12 | 2210 | 60 0 0 | 2221 |
| | Jupiter | E. | 102 54 58 | 2245 | 101 7 37 | 2253 | 99 20 29 | 2263 | 97 33 35 | 2274 |
| | Antares | E. | 111 19 15 | 2192 | 109 30 35 | 2200 | 107 42 8 | 2210 | 105 53 56 | 2221 |
| 10 | Aldebaran | W. | 83 27 43 | 2351 | 85 12 29 | 2364 | 86 56 56 | 2377 | 88 41 4 | 2391 |
| | Pollux | W. | 39 49 19 | 2285 | 41 35 40 | 2298 | 43 21 43 | 2311 | 45 7 26 | 2325 |
| | Spica | E. | 51 3 6 | 2280 | 49 16 37 | 2293 | 47 30 27 | 2306 | 45 44 37 | 2320 |
| | Jupiter | E. | 88 43 7 | 2332 | 86 57 54 | 2346 | 85 13 1 | 2359 | 83 28 27 | 2373 |
| | Antares | E. | 96 57 3 | 2280 | 95 10 34 | 2293 | 93 24 24 | 2307 | 91 38 34 | 2321 |
| 11 | Aldebaran | W. | 97 16 34 | 2467 | 98 58 34 | 2483 | 100 40 11 | 2500 | 102 21 24 | 2517 |
| | Pollux | W. | 53 50 54 | 2398 | 55 34 31 | 2414 | 57 17 46 | 2430 | 59 0 38 | 2446 |
| | Regulus | W. | 17 9 6 | 2429 | 18 51 59 | 2440 | 20 34 37 | 2452 | 22 16 58 | 2464 |
| | Spica | E. | 37 0 40 | 2395 | 35 16 58 | 2410 | 33 33 38 | 2426 | 31 50 41 | 2443 |
| | Jupiter | E. | 74 50 53 | 2449 | 73 8 28 | 2465 | 71 26 26 | 2482 | 69 44 47 | 2499 |
| | Antares | E. | 82 54 38 | 2395 | 81 10 56 | 2411 | 79 27 37 | 2426 | 77 44 40 | 2443 |
| 12 | Aldebaran | W. | 110 41 22 | 2608 | 112 20 6 | 2627 | 113 58 24 | 2646 | 115 36 16 | 2666 |
| | Pollux | W. | 67 29 12 | 2529 | 69 9 45 | 2546 | 70 49 54 | 2563 | 72 29 40 | 2580 |
| | Regulus | W. | 30 43 54 | 2538 | 32 24 14 | 2554 | 34 4 12 | 2571 | 35 43 47 | 2587 |
| | Spica | E. | 23 21 47 | 2527 | 21 41 11 | 2543 | 20 0 58 | 2560 | 18 21 8 | 2577 |
| | Jupiter | E. | 61 22 30 | 2585 | 59 43 15 | 2604 | 58 4 25 | 2622 | 56 26 0 | 2640 |
| | Antares | E. | 69 15 45 | 2526 | 67 35 8 | 2543 | 65 54 55 | 2561 | 64 15 6 | 2577 |
| | α Aquilæ | E. | 116 48 28 | 3575 | 115 29 26 | 3562 | 114 10 10 | 3553 | 112 50 44 | 3545 |
| | Sun | E. | 144 19 42 | 2886 | 142 47 5 | 2902 | 141 14 49 | 2920 | 139 42 55 | 2937 |
| 13 | Pollux | W. | 80 42 42 | 2665 | 82 20 9 | 2681 | 83 57 14 | 2698 | 85 33 57 | 2714 |
| | Regulus | W. | 43 56 9 | 2669 | 45 33 30 | 2685 | 47 10 30 | 2702 | 48 47 8 | 2718 |
| | Jupiter | E. | 48 20 5 | 2733 | 46 44 9 | 2751 | 45 8 37 | 2771 | 43 33 31 | 2789 |
| | Antares | E. | 56 1 49 | 2663 | 54 24 19 | 2679 | 52 47 11 | 2696 | 51 10 26 | 2712 |
| | α Aquilæ | E. | 106 12 24 | 3540 | 104 52 44 | 3544 | 103 33 8 | 3548 | 102 13 37 | 3555 |
| | Sun | E. | 132 8 55 | 3025 | 130 39 13 | 3042 | 129 9 52 | 3060 | 127 40 53 | 3078 |
| 14 | Pollux | W. | 93 32 8 | 2794 | 95 6 44 | 2808 | 96 41 1 | 2824 | 98 14 58 | 2838 |
| | Regulus | W. | 56 44 59 | 2796 | 58 19 32 | 2811 | 59 53 46 | 2826 | 61 27 40 | 2840 |
| | Jupiter | E. | 35 44 13 | 2887 | 34 11 38 | 2908 | 32 39 29 | 2928 | 31 7 46 | 2950 |
| | Antares | E. | 43 12 0 | 2792 | 41 37 21 | 2807 | 40 3 2 | 2821 | 38 29 2 | 2836 |
| | α Aquilæ | E. | 95 38 7 | 3600 | 94 19 33 | 3612 | 93 1 12 | 3624 | 91 43 4 | 3638 |
| | Sun | E. | 120 21 13 | 3161 | 118 54 17 | 3178 | 117 27 41 | 3194 | 116 1 24 | 3209 |
| 15 | Pollux | W. | 106 0 10 | 2906 | 107 32 21 | 2918 | 109 4 17 | 2931 | 110 35 57 | 2942 |
| | Regulus | W. | 69 12 42 | 2907 | 70 44 52 | 2920 | 72 16 46 | 2932 | 73 48 24 | 2943 |
| | Spica | W. | 15 10 24 | 2904 | 16 42 38 | 2916 | 18 14 37 | 2928 | 19 46 20 | 2939 |
| | Antares | E. | 30 43 36 | 2904 | 29 11 22 | 2916 | 27 39 23 | 2928 | 26 7 40 | 2940 |
| | α Aquilæ | E. | 85 16 13 | 3713 | 83 59 40 | 3731 | 82 43 26 | 3748 | 81 27 30 | 3768 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Mars | W. | 112° 55′ 3″ | 2378 | 114° 39′ 9″ | 2386 | 116° 23′ 4″ | 2394 | 118° 6′ 48″ | 2403 |
| | α Arietis | W. | 92 56 21 | 2192 | 94 45 1 | 2198 | 96 33 31 | 2206 | 98 21 49 | 2215 |
| | Aldebaran | W. | 62 11 55 | 2248 | 63 59 11 | 2253 | 65 46 20 | 2258 | 67 33 21 | 2264 |
| | Spica | E. | 72 42 4 | 2160 | 70 52 36 | 2167 | 69 3 18 | 2175 | 67 14 12 | 2183 |
| | Jupiter | E. | 110 6 19 | 2214 | 108 18 13 | 2221 | 106 30 17 | 2229 | 104 42 32 | 2236 |
| | Antares | E. | 118 35 59 | 2160 | 116 46 31 | 2167 | 114 57 14 | 2174 | 113 8 8 | 2183 |
| 9 | α Arietis | W. | 107 19 51 | 2266 | 109 6 40 | 2278 | 110 53 11 | 2291 | 112 39 23 | 2304 |
| | Aldebaran | W. | 76 25 52 | 2305 | 78 11 44 | 2316 | 79 57 20 | 2327 | 81 42 40 | 2339 |
| | Pollux | W. | 32 41 1 | 2239 | 34 28 30 | 2250 | 36 15 43 | 2261 | 38 2 40 | 2273 |
| | Spica | E. | 58 12 4 | 2232 | 56 24 24 | 2243 | 54 37 0 | 2255 | 52 49 54 | 2267 |
| | Jupiter | E. | 95 46 57 | 2284 | 94 0 34 | 2296 | 92 14 28 | 2307 | 90 28 39 | 2319 |
| | Antares | E. | 104 6 0 | 2232 | 102 18 20 | 2243 | 100 30 57 | 2255 | 98 43 51 | 2267 |
| 10 | Aldebaran | W. | 90 24 52 | 2405 | 92 8 20 | 2420 | 93 51 26 | 2435 | 95 34 11 | 2450 |
| | Pollux | W. | 46 52 49 | 2339 | 48 37 52 | 2353 | 50 22 34 | 2368 | 52 6 55 | 2383 |
| | Spica | E. | 43 59 7 | 2335 | 42 13 58 | 2349 | 40 29 10 | 2364 | 38 44 44 | 2380 |
| | Jupiter | E. | 81 44 14 | 2387 | 80 0 21 | 2403 | 78 16 50 | 2417 | 76 33 40 | 2433 |
| | Antares | E. | 89 53 5 | 2335 | 88 7 56 | 2350 | 86 23 9 | 2364 | 84 38 43 | 2379 |
| 11 | Aldebaran | W. | 104 2 13 | 2535 | 105 42 38 | 2553 | 107 22 38 | 2571 | 109 2 13 | 2590 |
| | Pollux | W. | 60 43 7 | 2463 | 62 25 13 | 2479 | 64 6 56 | 2495 | 65 48 16 | 2512 |
| | Regulus | W. | 23 59 2 | 2478 | 25 40 46 | 2492 | 27 22 10 | 2507 | 29 3 13 | 2523 |
| | Spica | E. | 30 8 8 | 2460 | 28 25 58 | 2476 | 26 44 11 | 2492 | 25 2 47 | 2509 |
| | Jupiter | E. | 68 3 32 | 2516 | 66 22 41 | 2533 | 64 42 13 | 2550 | 63 2 9 | 2568 |
| | Antares | E. | 76 2 6 | 2460 | 74 19 56 | 2476 | 72 38 9 | 2492 | 70 56 45 | 2510 |
| 12 | Aldebaran | W. | 117 13 42 | 2686 | 118 50 41 | 2706 | 120 27 13 | 2726 | 122 3 18 | 2746 |
| | Pollux | W. | 74 9 3 | 2596 | 75 48 3 | 2614 | 77 26 39 | 2631 | 79 4 52 | 2648 |
| | Regulus | W. | 37 23 0 | 2603 | 39 1 51 | 2620 | 40 40 19 | 2636 | 42 18 25 | 2652 |
| | Spica | E. | 16 41 42 | 2594 | 15 2 39 | 2612 | 13 24 0 | 2629 | 11 45 44 | 2645 |
| | Jupiter | E. | 54 47 59 | 2658 | 53 10 23 | 2677 | 51 33 12 | 2695 | 49 56 26 | 2714 |
| | Antares | E. | 62 35 40 | 2594 | 60 56 37 | 2612 | 59 17 58 | 2629 | 57 39 42 | 2646 |
| | α Aquilæ | E. | 111 31 10 | 3541 | 110 11 31 | 3538 | 108 51 49 | 3537 | 107 32 6 | 3538 |
| | Sun | E. | 138 11 23 | 2954 | 136 40 13 | 2972 | 135 9 25 | 2989 | 133 38 59 | 3007 |
| 13 | Pollux | W. | 87 10 18 | 2731 | 88 46 17 | 2747 | 90 21 55 | 2763 | 91 57 12 | 2779 |
| | Regulus | W. | 50 23 24 | 2734 | 51 59 19 | 2750 | 53 34 53 | 2766 | 55 10 6 | 2781 |
| | Jupiter | E. | 41 58 49 | 2808 | 40 24 32 | 2828 | 38 50 41 | 2847 | 37 17 14 | 2867 |
| | Antares | E. | 49 34 2 | 2729 | 47 58 0 | 2744 | 46 22 19 | 2760 | 44 46 59 | 2776 |
| | α Aquilæ | E. | 100 54 13 | 3562 | 99 34 57 | 3570 | 98 15 50 | 3579 | 96 56 53 | 3589 |
| | Sun | E. | 126 12 16 | 3095 | 124 44 0 | 3111 | 123 16 4 | 3128 | 121 48 28 | 3145 |
| 14 | Pollux | W. | 99 48 36 | 2852 | 101 21 56 | 2866 | 102 54 58 | 2880 | 104 27 42 | 2893 |
| | Regulus | W. | 63 1 16 | 2854 | 64 34 34 | 2868 | 66 7 34 | 2882 | 67 40 16 | 2895 |
| | Jupiter | E. | 29 36 30 | 2972 | 28 5 42 | 2996 | 26 35 24 | 3021 | 25 5 37 | 3046 |
| | Antares | E. | 36 55 21 | 2851 | 35 21 59 | 2864 | 33 48 54 | 2878 | 32 16 7 | 2891 |
| | α Aquilæ | E. | 90 25 11 | 3652 | 89 7 33 | 3666 | 87 50 10 | 3681 | 86 33 3 | 3697 |
| | Sun | E. | 114 35 25 | 3224 | 113 9 44 | 3239 | 111 44 21 | 3253 | 110 19 15 | 3267 |
| 15 | Pollux | W. | 112 7 23 | 2954 | 113 38 34 | 2964 | 115 9 32 | 2975 | 116 40 16 | 2985 |
| | Regulus | W. | 75 19 48 | 2954 | 76 50 58 | 2965 | 78 21 54 | 2976 | 79 52 37 | 2985 |
| | Spica | W. | 21 17 49 | 2950 | 22 49 4 | 2962 | 24 20 5 | 2972 | 25 50 53 | 2982 |
| | Antares | E. | 24 36 12 | 2951 | 23 4 58 | 2962 | 21 33 58 | 2973 | 20 3 11 | 2982 |
| | α Aquilæ | E. | 80 11 54 | 3786 | 78 56 37 | 3806 | 77 41 41 | 3826 | 76 27 6 | 3847 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | Sun | E. | 108° 54′ 25″ | 3281 | 107° 29′ 52″ | 3294 | 106° 5′ 34″ | 3307 | 104° 41′ 31″ | 3320 |
| 16 | Regulus | W. | 81 23 8 | 2994 | 82 53 28 | 3004 | 84 23 36 | 3013 | 85 53 33 | 3020 |
| | Spica | W. | 27 21 28 | 2991 | 28 51 52 | 3001 | 30 22 4 | 3009 | 31 52 6 | 3017 |
| | α Aquilæ | E. | 75 12 52 | 3868 | 73 59 0 | 3891 | 72 45 31 | 3915 | 71 32 26 | 3937 |
| | Sun | E. | 97 44 44 | 3376 | 96 22 0 | 3386 | 94 59 27 | 3394 | 93 37 4 | 3403 |
| 17 | Regulus | W. | 93 21 4 | 3053 | 94 50 11 | 3059 | 96 19 11 | 3063 | 97 48 6 | 3067 |
| | Spica | W. | 39 19 58 | 3050 | 40 49 9 | 3056 | 42 18 13 | 3060 | 43 47 12 | 3064 |
| | α Aquilæ | E. | 65 33 18 | 4074 | 64 22 51 | 4106 | 63 12 55 | 4138 | 62 3 30 | 4174 |
| | Sun | E. | 86 47 25 | 3439 | 85 25 52 | 3445 | 84 4 26 | 3449 | 82 43 5 | 3454 |
| 18 | Regulus | W. | 105 11 35 | 3081 | 106 40 8 | 3082 | 108 8 39 | 3083 | 109 37 10 | 3083 |
| | Spica | W. | 51 11 3 | 3078 | 52 39 40 | 3078 | 54 8 16 | 3079 | 55 36 51 | 3079 |
| | α Aquilæ | E. | 56 25 14 | 4378 | 55 19 33 | 4427 | 54 14 36 | 4480 | 53 10 26 | 4535 |
| | Sun | E. | 75 57 24 | 3468 | 74 36 24 | 3470 | 73 15 26 | 3471 | 71 54 29 | 3471 |
| 19 | Regulus | W. | 116 59 48 | 3078 | 118 28 25 | 3076 | 119 57 4 | 3073 | 121 25 47 | 3069 |
| | Spica | W. | 62 59 53 | 3074 | 64 28 34 | 3071 | 65 57 19 | 3069 | 67 26 7 | 3065 |
| | Jupiter | W. | 25 4 51 | 3214 | 26 30 43 | 3201 | 27 56 51 | 3189 | 29 23 13 | 3178 |
| | Antares | W. | 17 6 4 | 3074 | 18 34 45 | 3072 | 20 3 29 | 3069 | 21 32 17 | 3065 |
| | α Aquilæ | E. | 48 3 3 | 4891 | 47 4 41 | 4980 | 46 7 30 | 5077 | 45 11 35 | 5185 |
| | Sun | E. | 65 9 35 | 3464 | 63 48 31 | 3462 | 62 27 24 | 3458 | 61 6 13 | 3454 |
| 20 | Spica | W. | 74 51 20 | 3043 | 76 20 40 | 3037 | 77 50 7 | 3030 | 79 19 42 | 3025 |
| | Jupiter | W. | 36 38 17 | 3128 | 38 5 53 | 3119 | 39 33 40 | 3109 | 41 1 39 | 3100 |
| | Antares | W. | 28 57 28 | 3043 | 30 26 48 | 3037 | 31 56 15 | 3031 | 33 25 49 | 3025 |
| | Sun | E. | 54 19 9 | 3431 | 52 57 27 | 3424 | 51 35 38 | 3418 | 50 13 42 | 3411 |
| 21 | Spica | W. | 86 49 41 | 2988 | 88 20 9 | 2980 | 89 50 47 | 2971 | 91 21 36 | 2963 |
| | Jupiter | W. | 48 24 26 | 3052 | 49 53 35 | 3042 | 51 22 56 | 3032 | 52 52 29 | 3022 |
| | Antares | W. | 40 55 47 | 2989 | 42 26 14 | 2980 | 43 56 52 | 2971 | 45 27 41 | 2963 |
| | Sun | E. | 43 21 57 | 3372 | 41 59 9 | 3364 | 40 36 11 | 3355 | 39 13 3 | 3345 |
| 22 | Spica | W. | 98 58 27 | 2916 | 100 30 25 | 2906 | 102 2 36 | 2897 | 103 34 59 | 2886 |
| | Jupiter | W. | 60 23 27 | 2969 | 61 54 18 | 2958 | 63 25 23 | 2948 | 64 56 41 | 2937 |
| | Antares | W. | 53 4 32 | 2916 | 54 36 30 | 2907 | 56 8 40 | 2897 | 57 41 3 | 2886 |
| | Sun | E. | 32 14 40 | 3298 | 30 50 26 | 3288 | 29 26 0 | 3278 | 28 1 23 | 3268 |
| 26 | Sun | W. | 14 52 14 | 2966 | 16 23 9 | 2950 | 17 54 25 | 2935 | 19 26 0 | 2921 |
| 27 | Sun | W. | 27 7 49 | 2866 | 28 40 52 | 2856 | 30 14 8 | 2846 | 31 47 36 | 2837 |
| | Aldebaran | E. | 62 50 56 | 2609 | 61 12 13 | 2604 | 59 33 24 | 2600 | 57 54 29 | 2596 |
| | Pollux | E. | 105 55 7 | 2519 | 104 14 20 | 2512 | 102 33 23 | 2504 | 100 52 15 | 2496 |
| 28 | Sun | W. | 39 37 48 | 2795 | 41 12 23 | 2788 | 42 47 7 | 2780 | 44 22 1 | 2772 |
| | Aldebaran | E. | 49 38 50 | 2586 | 47 59 36 | 2586 | 46 20 22 | 2588 | 44 41 10 | 2591 |
| | Pollux | E. | 92 23 58 | 2460 | 90 41 49 | 2453 | 88 59 30 | 2447 | 87 17 2 | 2441 |
| | Regulus | E. | 129 11 11 | 2464 | 127 29 7 | 2456 | 125 46 52 | 2450 | 124 4 28 | 2443 |
| 29 | Sun | W. | 52 18 52 | 2738 | 53 54 41 | 2732 | 55 30 38 | 2726 | 57 6 43 | 2720 |
| | Venus | W. | 15 23 20 | 2826 | 16 57 14 | 2816 | 18 31 21 | 2807 | 20 5 40 | 2799 |
| | Aldebaran | E. | 36 26 42 | 2626 | 34 48 23 | 2640 | 33 10 23 | 2657 | 31 32 46 | 2680 |
| | Pollux | E. | 78 42 28 | 2410 | 76 59 8 | 2405 | 75 15 40 | 2398 | 73 32 3 | 2393 |
| | Regulus | E. | 115 30 10 | 2412 | 113 46 52 | 2406 | 112 3 26 | 2400 | 110 19 51 | 2395 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XV^h. | P. L. of Diff. | XVIII^h. | P. L. of Diff. | XXI^h. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | Sun | E. | 103° 17′ 43″ | 3332 | 101° 54′ 9″ | 3344 | 100° 30′ 48″ | 3355 | 99° 7′ 40″ | 3365 |
| 16 | Regulus | W. | 87 23 21 | 3028 | 88 52 59 | 3035 | 90 22 29 | 3042 | 91 51 50 | 3048 |
| | Spica | W. | 33 21 58 | 3025 | 34 51 40 | 3031 | 36 21 14 | 3038 | 37 50 40 | 3044 |
| | α Aquilæ | E. | 70 19 44 | 3962 | 69 7 27 | 3989 | 67 55 37 | 4017 | 66 44 14 | 4044 |
| | Sun | E. | 92 14 51 | 3411 | 90 52 47 | 3419 | 89 30 52 | 3426 | 88 9 5 | 3432 |
| 17 | Regulus | W. | 99 16 56 | 3071 | 100 45 41 | 3074 | 102 14 22 | 3077 | 103 43 0 | 3079 |
| | Spica | W. | 45 16 6 | 3068 | 46 44 55 | 3070 | 48 13 41 | 3073 | 49 42 23 | 3075 |
| | α Aquilæ | E. | 60 54 39 | 4210 | 59 46 22 | 4248 | 58 38 41 | 4289 | 57 31 38 | 4331 |
| | Sun | E. | 81 21 49 | 3458 | 80 0 38 | 3461 | 78 39 30 | 3464 | 77 18 26 | 3466 |
| 18 | Regulus | W. | 111 5 40 | 3083 | 112 34 10 | 3082 | 114 2 41 | 3081 | 115 31 14 | 3080 |
| | Spica | W. | 57 5 26 | 3079 | 58 34 1 | 3078 | 60 2 37 | 3078 | 61 31 14 | 3076 |
| | α Aquilæ | E. | 52 7 5 | 4596 | 51 4 37 | 4662 | 50 3 5 | 4732 | 49 2 32 | 4809 |
| | Sun | E. | 70 33 32 | 3470 | 69 12 31 | 3470 | 67 51 36 | 3468 | 66 30 36 | 3467 |
| 19 | Regulus | W. | 122 54 34 | 3066 | 124 23 25 | 3062 | 125 52 21 | 3058 | 127 21 22 | 3053 |
| | Spica | W. | 68 55 0 | 3061 | 70 23 57 | 3057 | 71 52 59 | 3053 | 73 22 6 | 3047 |
| | Jupiter | W. | 30 49 49 | 3167 | 32 16 38 | 3157 | 33 43 39 | 3147 | 35 10 52 | 3137 |
| | Antares | W. | 23 1 9 | 3062 | 24 30 5 | 3057 | 25 59 7 | 3053 | 27 28 14 | 3047 |
| | α Aquilæ | E. | 44 17 2 | 5302 | 43 23 56 | 5429 | 42 32 22 | 5570 | 41 42 27 | 5725 |
| | Sun | E. | 59 44 58 | 3450 | 58 23 38 | 3446 | 57 2 14 | 3441 | 55 40 44 | 3437 |
| 20 | Spica | W. | 80 49 24 | 3018 | 82 19 15 | 3011 | 83 49 14 | 3003 | 85 19 23 | 2996 |
| | Jupiter | W. | 42 29 49 | 3090 | 43 58 11 | 3081 | 45 26 44 | 3071 | 46 55 29 | 3061 |
| | Antares | W. | 34 55 31 | 3018 | 36 25 22 | 3011 | 37 55 21 | 3004 | 39 25 29 | 2996 |
| | Sun | E. | 48 51 38 | 3404 | 47 29 26 | 3396 | 46 7 5 | 3389 | 44 44 36 | 3380 |
| 21 | Spica | W. | 92 52 35 | 2954 | 94 23 45 | 2945 | 95 55 7 | 2935 | 97 26 41 | 2926 |
| | Jupiter | W. | 54 22 15 | 3011 | 55 52 14 | 3001 | 57 22 25 | 2991 | 58 52 49 | 2980 |
| | Antares | W. | 46 58 40 | 2954 | 48 29 50 | 2945 | 50 1 12 | 2935 | 51 32 46 | 2926 |
| | Sun | E. | 37 49 44 | 3336 | 36 26 14 | 3327 | 35 2 34 | 3318 | 33 38 43 | 3307 |
| 22 | Spica | W. | 105 7 36 | 2876 | 106 40 26 | 2866 | 108 13 29 | 2855 | 109 46 46 | 2845 |
| | Jupiter | W. | 66 28 13 | 2926 | 67 59 59 | 2914 | 69 32 0 | 2904 | 71 4 14 | 2892 |
| | Antares | W. | 59 13 40 | 2876 | 60 46 29 | 2866 | 62 19 32 | 2855 | 63 52 49 | 2845 |
| | Sun | E. | 26 36 34 | 3258 | 25 11 33 | 3248 | 23 46 21 | 3239 | 22 20 57 | 3231 |
| 26 | Sun | W. | 20 57 52 | 2909 | 22 30 0 | 2698 | 24 2 22 | 2886 | 25 34 59 | 2876 |
| 27 | Sun | W. | 33 21 16 | 2828 | 34 55 7 | 2819 | 36 29 10 | 2811 | 38 3 24 | 2803 |
| | Aldebaran | E. | 56 15 29 | 2593 | 54 36 24 | 2590 | 52 57 15 | 2588 | 51 18 3 | 2587 |
| | Pollux | E. | 99 10 56 | 2489 | 97 29 27 | 2481 | 95 47 47 | 2474 | 94 5 57 | 2467 |
| 28 | Sun | W. | 45 57 5 | 2766 | 47 32 18 | 2758 | 49 7 41 | 2752 | 50 43 12 | 2745 |
| | Aldebaran | E. | 43 2 2 | 2594 | 41 22 59 | 2599 | 39 44 3 | 2606 | 38 5 16 | 2615 |
| | Pollux | E. | 85 34 25 | 2434 | 83 51 39 | 2428 | 82 8 44 | 2422 | 80 25 40 | 2416 |
| | Regulus | E. | 122 21 54 | 2436 | 120 39 11 | 2430 | 118 56 19 | 2424 | 117 13 19 | 2418 |
| 29 | Sun | W. | 58 42 57 | 2714 | 60 19 19 | 2708 | 61 55 48 | 2702 | 63 32 25 | 2696 |
| | Venus | W. | 21 40 9 | 2791 | 23 14 49 | 2783 | 24 49 39 | 2776 | 26 24 38 | 2770 |
| | Aldebaran | E. | 29 55 39 | 2707 | 28 19 8 | 2739 | 26 43 20 | 2780 | 25 8 26 | 2830 |
| | Pollux | E. | 71 48 19 | 2388 | 70 4 27 | 2383 | 68 20 28 | 2378 | 66 36 21 | 2373 |
| | Regulus | E. | 108 36 9 | 2369 | 106 52 19 | 2384 | 105 8 21 | 2379 | 103 24 16 | 2373 |

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sidereal Time of the Semi-diameter passing the Merid-ian. | Equation of Time, *to be added to Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | Semi-diameter. | | | |
| | | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Wed. | 1 | 22 51 0.72 | 9.348 | S. 7 19 52.5 | +57.16 | 16 10.21 | 65.38 | 12 27.22 | 0.507 |
| Thur. | 2 | 22 54 44.80 | 9.327 | 6 56 57.3 | 57.41 | 16 9.97 | 65.31 | 12 14.79 | 0.528 |
| Frid. | 3 | 22 58 28.39 | 9.307 | 6 33 56.6 | 57.64 | 16 9.73 | 65.24 | 12 1.85 | 0.549 |
| Sat. | 4 | 23 2 11.50 | 9.287 | 6 10 50.6 | 57.85 | 16 9.49 | 65.17 | 11 48.44 | 0.568 |
| *Sun.* | 5 | 23 5 54.15 | 9.269 | 5 47 39.7 | 58.05 | 16 9.24 | 65.11 | 11 34.58 | 0.586 |
| Mon. | 6 | 23 9 36.38 | 9.250 | 5 24 24.2 | 58.23 | 16 8.99 | 65.05 | 11 20.29 | 0.603 |
| Tues. | 7 | 23 13 18.19 | 9.233 | 5 1 4.5 | 58.40 | 16 8.74 | 65.00 | 11 5.59 | 0.621 |
| Wed. | 8 | 23 16 59.61 | 9.217 | 4 37 40.9 | 58.55 | 16 8.48 | 64.94 | 10 50.49 | 0.637 |
| Thur. | 9 | 23 20 40.64 | 9.202 | 4 14 13.8 | 58.69 | 16 8.22 | 64.89 | 10 35.01 | 0.652 |
| Frid. | 10 | 23 24 21.33 | 9.188 | 3 50 43.8 | 58.81 | 16 7.96 | 64.84 | 10 19.19 | 0.666 |
| Sat. | 11 | 23 28 1.69 | 9.175 | 3 27 10.9 | 58.92 | 16 7.70 | 64.80 | 10 3.05 | 0.679 |
| *Sun.* | 12 | 23 31 41.75 | 9.163 | 3 3 35.6 | 59.01 | 16 7.43 | 64.75 | 9 46.61 | 0.691 |
| Mon. | 13 | 23 35 21.54 | 9.152 | 2 39 58.1 | 59.09 | 16 7.16 | 64.71 | 9 29.88 | 0.702 |
| Tues. | 14 | 23 39 1.07 | 9.142 | 2 16 19.0 | 59.16 | 16 6.89 | 64.67 | 9 12.91 | 0.711 |
| Wed. | 15 | 23 42 40.39 | 9.133 | 1 52 38.4 | 59.21 | 16 6.61 | 64.64 | 8 55.72 | 0.720 |
| Thur. | 16 | 23 46 19.50 | 9.125 | 1 28 56.8 | 59.25 | 16 6.34 | 64.61 | 8 38.33 | 0.728 |
| Frid. | 17 | 23 49 58.43 | 9.118 | 1 5 14.5 | 59.27 | 16 6.06 | 64 58 | 8 20.75 | 0.736 |
| Sat. | 18 | 23 53 37.19 | 9.112 | 0 41 32.1 | 59.28 | 16 5.78 | 64.56 | 8 3.00 | 0.742 |
| *Sun.* | 19 | 23 57 15.79 | 9.106 | S. 0 17 49.5 | 59.27 | 16 5.50 | 64.54 | 7 45.09 | 0.748 |
| Mon. | 20 | 0 0 54.27 | 9.101 | N. 0 5 52.8 | 59.24 | 16 5.22 | 64.52 | 7 27.06 | 0.753 |
| Tues. | 21 | 0 4 32.65 | 9.097 | 0 29 34.2 | 59.20 | 16 4.94 | 64.50 | 7 8.94 | 0.757 |
| Wed. | 22 | 0 8 10.95 | 9.094 | 0 53 14.4 | 59.15 | 16 4.66 | 64.49 | 6 50.74 | 0.760 |
| Thur. | 23 | 0 11 49.18 | 9.091 | 1 16 53.3 | 59.08 | 16 4.38 | 64.48 | 6 32.46 | 0.763 |
| Frid. | 24 | 0 15 27.35 | 9.089 | 1 40 30.2 | 58.99 | 16 4.10 | 64.47 | 6 14.13 | 0.764 |
| Sat. | 25 | 0 19 5.48 | 9.088 | 2 4 4.6 | 58.88 | 16 3.82 | 64.46 | 5 55.76 | 0.765 |
| *Sun.* | 26 | 0 22 43.60 | 9.088 | 2 27 36.3 | 58.76 | 16 3.54 | 64.46 | 5 37.39 | 0 766 |
| Mon. | 27 | 0 26 21.73 | 9.088 | 2 51 5.1 | 58.63 | 16 3.27 | 64.46 | 5 19.01 | 0.766 |
| Tues. | 28 | 0 29 59.86 | 9.089 | 3 14 30.4 | 58.48 | 16 2.99 | 64.46 | 5 0.64 | 0.765 |
| Wed. | 29 | 0 33 38.02 | 9.091 | 3 37 51.7 | 58.31 | 16 2.72 | 64.47 | 4 42.29 | 0.764 |
| Thur. | 30 | 0 37 16.23 | 9.093 | 4 1 9.0 | 58.13 | 16 2.44 | 64.48 | 4 24.00 | 0.761 |
| Frid. | 31 | 0 40 54.51 | 9.096 | 4 24 21.6 | 57.93 | 16 2.17 | 64.49 | 4 5.78 | 0.758 |
| Sat. | 32 | 0 44 32.88 | 9.100 | N. 4 47 29.4 | +57.72 | 16 1.90 | 64.51 | 3 47.65 | 0.754 |

**Note.**—Mean Time of the Semidiameter passing may be found by subtracting $0^{s}.18$ from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing, and that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, *to be subtracted from Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | | | |
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Wed. | 1 | 22 50 58.78 | 9.349 | S. 7 20 4.3 | +57.17 | 12 27.33 | 0.507 | 22 38 31.45 |
| Thur. | 2 | 22 54 42.90 | 9.328 | 6 57 9.1 | 57.42 | 12 14.90 | 0.528 | 22 42 28.00 |
| Frid. | 3 | 22 58 26.52 | 9.308 | 6 34 8.2 | 57.65 | 12 1.96 | 0.549 | 22 46 24.56 |
| Sat. | 4 | 23 2 9.67 | 9.289 | 6 11 2.0 | 57.86 | 11 48.56 | 0.568 | 22 50 21.11 |
| *Sun.* | 5 | 23 5 52.36 | 9.270 | 5 47 50.9 | 58.06 | 11 34.69 | 0.586 | 22 54 17.67 |
| Mon. | 6 | 23 9 34.63 | 9.252 | 5 24 35.2 | 58.26 | 11 20.41 | 0.603 | 22 58 14.22 |
| Tues. | 7 | 23 13 16.48 | 9.235 | 5 1 15.3 | 58.41 | 11 5.70 | 0.621 | 23 2 10.78 |
| Wed. | 8 | 23 16 57.93 | 9.219 | 4 37 51.5 | 58.56 | 10 50.60 | 0.637 | 23 6 7.33 |
| Thur. | 9 | 23 20 39.01 | 9.204 | 4 14 24.2 | 58.70 | 10 35.12 | 0.652 | 23 10 3.89 |
| Frid. | 10 | 23 24 19.75 | 9.190 | 3 50 53.9 | 58.82 | 10 19.31 | 0.666 | 23 14 0.44 |
| Sat. | 11 | 23 28 0.15 | 9.177 | 3 27 20.7 | 58.93 | 10 3.16 | 0.679 | 23 17 56.99 |
| *Sun.* | 12 | 23 31 40.26 | 9.165 | 3 3 45.2 | 59.02 | 9 46.72 | 0.691 | 23 21 53.54 |
| Mon. | 13 | 23 35 20.09 | 9.154 | 2 40 7.5 | 59.10 | 9 29.99 | 0.702 | 23 25 50.10 |
| Tues. | 14 | 23 38 59.67 | 9.144 | 2 16 28.2 | 59.17 | 9 13.02 | 0.711 | 23 29 46.65 |
| Wed. | 15 | 23 42 39.03 | 9.135 | 1 52 47.3 | 59.22 | 8 55.82 | 0.720 | 23 33 43.21 |
| Thur. | 16 | 23 46 18.19 | 9.127 | 1 29 5.4 | 59.26 | 8 38.43 | 0.728 | 23 37 39.76 |
| Frid. | 17 | 23 49 57.16 | 9.120 | 1 5 22.8 | 59.28 | 8 20.85 | 0.736 | 23 41 36.31 |
| Sat. | 18 | 23 53 35.96 | 9.114 | 0 41 40.0 | 59.29 | 8 3.10 | 0.742 | 23 45 32.86 |
| *Sun.* | 19 | 23 57 14.61 | 9.108 | S. 0 17 57.1 | 59.28 | 7 45.16 | 0.748 | 23 49 29.42 |
| Mon. | 20 | 0 0 53.14 | 9.103 | N. 0 5 45.4 | 59.25 | 7 27.17 | 0.753 | 23 53 25.97 |
| Tues. | 21 | 0 4 31.57 | 9.099 | 0 29 27.1 | 59.21 | 7 9.04 | 0.757 | 23 57 22.53 |
| Wed. | 22 | 0 8 9.91 | 9.096 | 0 53 7.6 | 59.16 | 6 50.83 | 0.760 | 0 1 19.08 |
| Thur. | 23 | 0 11 48.18 | 9.093 | 1 16 46.8 | 59.09 | 6 32.54 | 0.763 | 0 5 15.64 |
| Frid. | 24 | 0 15 26.40 | 9.091 | 1 40 24.1 | 59.00 | 6 14.21 | 0.764 | 0 9 12.19 |
| Sat. | 25 | 0 19 4.58 | 9.090 | 2 3 58.8 | 58.89 | 5 55.84 | 0.765 | 0 13 8.74 |
| *Sun.* | 26 | 0 22 42.75 | 9.090 | 2 27 30.8 | 58.77 | 5 37.46 | 0.766 | 0 17 5.29 |
| Mon. | 27 | 0 26 20.92 | 9.090 | 2 50 59.9 | 58.64 | 5 19.07 | 0.766 | 0 21 1.85 |
| Tues. | 28 | 0 29 59.10 | 9.091 | 3 14 25.5 | 58.49 | 5 0.70 | 0.765 | 0 24 58.40 |
| Wed. | 29 | 0 33 37.31 | 9.093 | 3 37 47.1 | 58.32 | 4 42.35 | 0.764 | 0 28 54.96 |
| Thur. | 30 | 0 37 15.57 | 9.095 | 4 1 4.7 | 58.14 | 4 24.06 | 0.761 | 0 32 51.51 |
| Frid. | 31 | 0 40 53.90 | 9.098 | 4 24 17.6 | 57.94 | 4 5.84 | 0.758 | 0 36 48.06 |
| Sat. | 32 | 0 44 32.31 | 9.102 | N. 4 47 25.8 | +57.73 | 3 47.70 | 0.754 | 0 40 44.61 |

**Note.**—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour. $+9^{s}.8565$

## AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S *True* LONGITUDE. λ | THE SUN'S *True* LONGITUDE. λ′ | THE SUN'S Diff. for 1 hour. | THE SUN'S LATITUDE. | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 61 | 341 18 0.6 | 17 51.6 | 150.39 | +0.59 | 9.9963073 | +44.7 | 1 21 15.19 |
| 2 | 62 | 342 18 8.8 | 17 59.6 | 150.30 | 0.66 | .9964151 | 45.0 | 1 17 19.28 |
| 3 | 63 | 343 18 14.8 | 18 5.5 | 150.21 | 0.71 | .9965237 | 45.4 | 1 13 23.37 |
| 4 | 64 | 344 18 18.7 | 18 9.3 | 150.12 | 0.73 | .9966333 | 45.9 | 1 9 27.47 |
| 5 | 65 | 345 18 20.4 | 18 10.9 | 150.03 | 0.72 | .9967441 | 46.4 | 1 5 31.56 |
| 6 | 66 | 346 18 19.9 | 18 10.3 | 149.94 | 0.66 | .9968561 | 46.9 | 1 1 35.65 |
| 7 | 67 | 347 18 17.3 | 18 7.6 | 149.85 | 0.60 | .9969693 | 47.4 | 0 57 39.74 |
| 8 | 68 | 348 18 12.7 | 18 2.9 | 149.77 | 0.50 | .9970838 | 48.0 | 0 53 43.83 |
| 9 | 69 | 349 18 6.0 | 17 56.1 | 149.68 | 0.40 | .9971998 | 48.6 | 0 49 47.93 |
| 10 | 70 | 350 17 57.3 | 17 47.3 | 149.60 | 0.27 | .9973173 | 49.2 | 0 45 52.03 |
| 11 | 71 | 351 17 46.6 | 17 36.5 | 149.52 | 0.14 | .9974362 | 49.7 | 0 41 56.12 |
| 12 | 72 | 352 17 34.0 | 17 23.8 | 149.44 | +0.01 | .9975561 | 50.2 | 0 38 0.21 |
| 13 | 73 | 353 17 19.5 | 17 9.2 | 149.36 | −0.12 | .9976772 | 50.7 | 0 34 4.30 |
| 14 | 74 | 354 17 3.2 | 16 52.8 | 149.28 | 0.22 | .9977996 | 51.1 | 0 30 8.39 |
| 15 | 75 | 355 16 45.2 | 16 34.7 | 149.21 | 0.32 | .9979229 | 51.5 | 0 26 12.48 |
| 16 | 76 | 356 16 25.5 | 16 14.9 | 149.14 | 0.37 | .9980471 | 51.8 | 0 22 16.58 |
| 17 | 77 | 357 16 4.1 | 15 53.4 | 149.07 | 0.41 | .9981720 | 52.1 | 0 18 20.67 |
| 18 | 78 | 358 15 41.0 | 15 30.1 | 149.00 | 0.41 | .9982974 | 52.3 | 0 14 24.76 |
| 19 | 79 | 359 15 16.1 | 15 5.1 | 148.93 | 0.38 | .9984233 | 52.5 | 0 10 28.85 |
| 20 | 80 | 0 14 49.5 | 14 38.4 | 148.85 | 0.32 | .9985493 | 52.5 | 0 6 32.93 |
| 21 | 81 | 1 14 21.1 | 14 9.9 | 148.77 | 0.23 | .9986753 | 52.5 | 0 2 37.04<br>23 58 41.13 |
| 22 | 82 | 2 13 50.8 | 13 39.4 | 148.69 | 0.13 | .9988012 | 52.5 | 23 54 45.22 |
| 23 | 83 | 3 13 18.5 | 13 7.0 | 148.61 | −0.01 | .9989269 | 52.4 | 23 50 49.31 |
| 24 | 84 | 4 12 44.3 | 12 32.7 | 148.53 | +0.12 | .9990524 | 52.2 | 23 46 53.41 |
| 25 | 85 | 5 12 8.1 | 11 56.4 | 148.45 | 0.26 | .9991776 | 52.0 | 23 42 57.50 |
| 26 | 86 | 6 11 29.9 | 11 18.1 | 148.37 | 0.39 | .9993022 | 51.8 | 23 39 1.59 |
| 27 | 87 | 7 10 49.7 | 10 37.7 | 148.28 | 0.52 | .9994263 | 51.6 | 23 35 5.69 |
| 28 | 88 | 8 10 7.3 | 9 55.1 | 148.19 | 0.61 | .9995500 | 51.4 | 23 31 9.78 |
| 29 | 89 | 9 9 22.6 | 9 10.3 | 148.09 | 0.70 | .9996734 | 51.3 | 23 27 13.87 |
| 30 | 90 | 10 8 35.5 | 8 23.1 | 147.99 | 0.76 | .9997963 | 51.2 | 23 23 17.96 |
| 31 | 91 | 11 7 46.1 | 7 33.6 | 147.89 | 0.78 | 9.9999189 | 51.1 | 23 19 22.05 |
| 32 | 92 | 12 6 54.4 | 6 41.8 | 147.79 | +0.78 | 0.0000414 | +51.0 | 23 15 26.15 |

**Note:** λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
$-9^s.8296$

GREENWICH MEAN TIME.

| Day of the Month. | THE MOON'S | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | MERIDIAN PASSAGE. | | AGE. |
| | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. | | Diff. for 1 hour. | Noon. |
| | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 16 1.6 | 16 4.0 | 58 42.6 | +0.78 | 58 51.5 | +0.71 | 4 21.9 | 2.27 | 5.2 |
| 2 | 16 6.2 | 16 8.2 | 58 59.5 | 0.63 | 59 6.7 | 0.56 | 5 18.5 | 2.46 | 6.2 |
| 3 | 16 9.8 | 16 11.2 | 59 12.8 | 0.47 | 59 17.9 | 0.37 | 6 19.4 | 2.61 | 7.2 |
| 4 | 16 12.3 | 16 13.0 | 59 21.7 | 0.26 | 59 24.2 | +0.15 | 7 22.7 | 2.65 | 8.2 |
| 5 | 16 13.2 | 16 13.1 | 59 25.3 | +0.03 | 59 24.7 | −0.12 | 8 25.7 | 2.57 | 9.2 |
| 6 | 16 12.4 | 16 11.2 | 59 22.3 | −0.28 | 59 17.9 | 0.45 | 9 25.6 | 2.41 | 10.2 |
| 7 | 16 9.4 | 16 7.1 | 59 11.4 | 0.63 | 59 2.8 | 0.80 | 10 21.3 | 2.22 | 11.2 |
| 8 | 16 4.2 | 16 0.7 | 58 52.1 | 0.98 | 58 39.3 | 1.15 | 11 12.5 | 2.05 | 12.2 |
| 9 | 15 56.7 | 15 52.2 | 58 24.6 | 1.30 | 58 8.2 | 1.43 | 12 0.2 | 1.93 | 13.2 |
| 10 | 15 47.4 | 15 42.2 | 57 50.3 | 1.55 | 57 31.2 | 1.64 | 12 45.5 | 1.85 | 14.2 |
| 11 | 15 36.7 | 15 31.2 | 57 11.2 | 1.69 | 56 50.8 | 1.71 | 13 29.6 | 1.83 | 15.2 |
| 12 | 15 25.6 | 15 20.2 | 56 30.4 | 1.69 | 56 10.3 | 1.66 | 14 13.7 | 1.85 | 16.2 |
| 13 | 15 14.8 | 15 9.8 | 55 50.8 | 1.59 | 55 32.3 | 1.49 | 14 58.8 | 1.91 | 17.2 |
| 14 | 15 5.2 | 15 1.0 | 55 15.2 | 1.36 | 54 59.8 | 1.21 | 15 45.5 | 1.99 | 18.2 |
| 15 | 14 57.3 | 14 54.2 | 54 46.3 | 1.04 | 54 35.0 | 0.85 | 16 34.3 | 2.07 | 19.2 |
| 16 | 14 51.7 | 14 50.0 | 54 25.9 | 0.66 | 54 19.3 | 0.44 | 17 24.8 | 2.14 | 20.2 |
| 17 | 14 48.8 | 14 48.4 | 54 15.2 | −0.23 | 54 13.8 | −0.01 | 18 16.4 | 2.16 | 21.2 |
| 18 | 14 48.8 | 14 49.8 | 54 15.0 | +0.21 | 54 18.9 | +0.43 | 19 8.1 | 2.14 | 22.2 |
| 19 | 14 51.6 | 14 54.0 | 54 25.3 | 0.64 | 54 34.2 | 0.84 | 19 58.7 | 2.08 | 23.2 |
| 20 | 14 57.0 | 15 0.7 | 54 45.4 | 1.03 | 54 58.8 | 1.20 | 20 47.7 | 2.00 | 24.2 |
| 21 | 15 4.9 | 15 9.5 | 55 14.2 | 1.36 | 55 31.4 | 1.49 | 21 34.9 | 1.92 | 25.2 |
| 22 | 15 14.6 | 15 19.9 | 55 49.9 | 1.59 | 56 9.5 | 1.67 | 22 20.4 | 1.87 | 26.2 |
| 23 | 15 25.4 | 15 31.1 | 56 29.8 | 1.71 | 56 50.5 | 1.73 | 23 4.9 | 1.85 | 27.2 |
| 24 | 15 36.7 | 15 42.2 | 57 11.2 | 1.71 | 57 31.4 | 1.66 | 23 49.5 | 1.88 | 28.2 |
| 25 | 15 47.5 | 15 52.5 | 57 50.8 | 1.57 | 58 9.0 | 1.46 | δ | | 29.2 |
| 26 | 15 57.0 | 16 1.1 | 58 25.8 | 1.33 | 58 40.8 | 1.17 | 0 35.4 | 1.96 | 0.7 |
| 27 | 16 4.7 | 16 7.6 | 58 53.8 | 1.00 | 59 4.7 | 0.82 | 1 23.9 | 2.09 | 1.7 |
| 28 | 16 10.0 | 16 11.8 | 59 13.5 | 0.64 | 59 20.1 | 0.47 | 2 16.1 | 2.26 | 2.7 |
| 29 | 16 13.1 | 16 13.7 | 59 24.7 | +0.29 | 59 27.1 | +0.13 | 3 12.6 | 2.45 | 3.7 |
| 30 | 16 13.9 | 16 13.6 | 59 27.7 | −0.03 | 59 26.5 | −0.17 | 4 13.2 | 2.60 | 4.7 |
| 31 | 16 12.8 | 16 11.6 | 59 23.8 | 0.29 | 59 19.6 | 0.40 | 5 16.4 | 2.65 | 5.7 |
| 32 | 16 10.2 | 16 8.4 | 59 14.2 | −0.50 | 59 7.7 | −0.58 | 6 19.4 | 2.58 | 6.7 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| WEDNESDAY 1. | | | | | FRIDAY 3. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 2 50 55.88 | 2.3167 | N.20 27 14.8 | 12.242 | 0 | 4 50 6.55 | 2.6312 | N.27 36 52.6 | 5.049 |
| 1 | 2 53 15.09 | 2.3237 | 20 39 26.0 | 12.132 | 1 | 4 52 44.56 | 2.6358 | 27 41 50.0 | 4.865 |
| 2 | 2 55 34.73 | 2.3308 | 20 51 30.6 | 12.020 | 2 | 4 55 22.85 | 2.6403 | 27 46 36.4 | 4.680 |
| 3 | 2 57 54.79 | 2.3379 | 21 3 28.4 | 11.906 | 3 | 4 58 1.40 | 2.6447 | 27 51 11.6 | 4.492 |
| 4 | 3 0 15.28 | 2.3450 | 21 15 19.3 | 11.789 | 4 | 5 0 40.21 | 2.6490 | 27 55 35.5 | 4.303 |
| 5 | 3 2 36.19 | 2.3521 | 21 27 3.1 | 11.670 | 5 | 5 3 19.28 | 2.6532 | 27 59 48.0 | 4.114 |
| 6 | 3 4 57.53 | 2.3592 | 21 38 39.7 | 11.550 | 6 | 5 5 58.59 | 2.6571 | 28 3 49.2 | 3.924 |
| 7 | 3 7 19.30 | 2.3664 | 21 50 9.1 | 11.429 | 7 | 5 8 38.13 | 2.6609 | 28 7 38.9 | 3.732 |
| 8 | 3 9 41.50 | 2.3737 | 22 1 31.2 | 11.307 | 8 | 5 11 17.90 | 2.6646 | 28 11 17.1 | 3.540 |
| 9 | 3 12 4.14 | 2.3809 | 22 12 45.9 | 11.182 | 9 | 5 13 57.88 | 2.6681 | 28 14 43.7 | 3.347 |
| 10 | 3 14 27.21 | 2.3881 | 22 23 53.0 | 11.055 | 10 | 5 16 38.07 | 2.6715 | 28 17 58.7 | 3.153 |
| 11 | 3 16 50.71 | 2.3952 | 22 34 52.5 | 10.927 | 11 | 5 19 18.46 | 2.6747 | 28 21 2.0 | 2.958 |
| 12 | 3 19 14.63 | 2.4024 | 22 45 44.2 | 10.797 | 12 | 5 21 59.03 | 2.6777 | 28 23 53.7 | 2.763 |
| 13 | 3 21 38.99 | 2.4096 | 22 56 28.1 | 10.665 | 13 | 5 24 39.78 | 2.6806 | 28 26 33.6 | 2.567 |
| 14 | 3 24 3.78 | 2.4167 | 23 7 4.0 | 10.531 | 14 | 5 27 20.70 | 2.6833 | 28 29 1.7 | 2.370 |
| 15 | 3 26 29.00 | 2.4239 | 23 17 31.8 | 10.396 | 15 | 5 30 1.77 | 2.6858 | 28 31 18.0 | 2.172 |
| 16 | 3 28 54.65 | 2.4310 | 23 27 51.5 | 10.259 | 16 | 5 32 42.99 | 2.6882 | 28 33 22.4 | 1.974 |
| 17 | 3 31 20.72 | 2.4381 | 23 38 2.9 | 10.121 | 17 | 5 35 24.35 | 2.6903 | 28 35 14.9 | 1.777 |
| 18 | 3 33 47.22 | 2.4452 | 23 48 6.0 | 9.981 | 18 | 5 38 5.83 | 2.6923 | 28 36 55.6 | 1.578 |
| 19 | 3 36 14.15 | 2.4523 | 23 58 0.6 | 9.838 | 19 | 5 40 47.43 | 2.6942 | 28 38 24.3 | 1.378 |
| 20 | 3 38 41.50 | 2.4593 | 24 7 46.6 | 9.695 | 20 | 5 43 29.13 | 2.6958 | 28 39 41.0 | 1.178 |
| 21 | 3 41 9.27 | 2.4663 | 27 17 24.0 | 9.550 | 21 | 5 46 10.92 | 2.6972 | 28 40 45.7 | 0.978 |
| 22 | 3 43 37.46 | 2.4733 | 24 26 52.6 | 9.403 | 22 | 5 48 52.79 | 2.6985 | 28 41 38.4 | 0.777 |
| 23 | 3 46 6.07 | 2.4804 | N.24 36 12.3 | 9.254 | 23 | 5 51 34.74 | 2.6997 | N.28 42 19.0 | 0.577 |
| THURSDAY 2. | | | | | SATURDAY 4. | | | | |
| 0 | 3 48 35.11 | 2.4874 | N.24 45 23.1 | 9.104 | 0 | 5 54 16.75 | 2.7006 | N.28 42 47.6 | 0.376 |
| 1 | 3 51 4.56 | 2.4942 | 24 54 24.8 | 8.952 | 1 | 5 56 58.81 | 2.7013 | 28 43 4.1 | +0.174 |
| 2 | 3 53 34.41 | 2.5009 | 25 3 17.4 | 8.799 | 2 | 5 59 40.91 | 2.7018 | 28 43 8.5 | −0.027 |
| 3 | 3 56 4.67 | 2.5077 | 25 12 0.7 | 8.643 | 3 | 6 2 23.03 | 2.7022 | 28 43 0.9 | 0.228 |
| 4 | 3 58 35.33 | 2.5144 | 25 20 34.6 | 8.487 | 4 | 6 5 5.17 | 2.7024 | 28 42 41.2 | 0.429 |
| 5 | 4 1 6.39 | 2.5211 | 25 28 59.1 | 8.329 | 5 | 6 7 47.32 | 2.7024 | 28 42 9.4 | 0.631 |
| 6 | 4 3 37.86 | 2.5277 | 25 37 14.1 | 8.170 | 6 | 6 10 29.46 | 2.7022 | 28 41 25.5 | 0.832 |
| 7 | 4 6 9.72 | 2.5342 | 25 45 19.5 | 8.008 | 7 | 6 13 11.58 | 2.7018 | 28 40 29.5 | 1.034 |
| 8 | 4 8 41.96 | 2.5406 | 25 53 15.1 | 7.845 | 8 | 6 15 53.68 | 2.7013 | 28 39 21.4 | 1.235 |
| 9 | 4 11 14.59 | 2.5470 | 26 1 0.9 | 7.681 | 9 | 6 18 35.74 | 2.7006 | 28 38 1.3 | 1.436 |
| 10 | 4 13 47.60 | 2.5533 | 26 8 36.8 | 7.515 | 10 | 6 21 17.76 | 2.6997 | 28 36 29.1 | 1.637 |
| 11 | 4 16 20.98 | 2.5595 | 26 16 2.7 | 7.347 | 11 | 6 23 59.71 | 2.6985 | 28 34 44.8 | 1.838 |
| 12 | 4 18 54.74 | 2.5657 | 26 23 18.5 | 7.179 | 12 | 6 26 41.58 | 2.6972 | 28 32 48.5 | 2.038 |
| 13 | 4 21 28.86 | 2.5717 | 26 30 24.2 | 7.009 | 13 | 6 29 23.37 | 2.6958 | 28 30 40.2 | 2.238 |
| 14 | 4 24 3.34 | 2.5777 | 26 37 19.6 | 6.838 | 14 | 6 32 5.07 | 2.6942 | 28 28 19.9 | 2.437 |
| 15 | 4 26 38.18 | 2.5835 | 26 44 4.7 | 6.665 | 15 | 6 34 46.67 | 2.6923 | 28 25 47.7 | 2.637 |
| 16 | 4 29 13.36 | 2.5892 | 26 50 39.4 | 6.491 | 16 | 6 37 28.15 | 2.6903 | 28 23 3.5 | 2.836 |
| 17 | 4 31 48.88 | 2.5948 | 26 57 3.6 | 6.315 | 17 | 6 40 9.51 | 2.6882 | 28 20 7.4 | 3.034 |
| 18 | 4 34 24.74 | 2.6004 | 27 3 17.2 | 6.138 | 18 | 6 42 50.73 | 2.6858 | 28 16 59.4 | 3.232 |
| 19 | 4 37 0.93 | 2.6058 | 27 9 20.2 | 5.960 | 19 | 6 45 31.80 | 2.6833 | 28 13 39.6 | 3.429 |
| 20 | 4 39 37.44 | 2.6111 | 27 15 12.4 | 5.781 | 20 | 6 48 12.72 | 2.6806 | 28 10 7.9 | 3.626 |
| 21 | 4 42 14.26 | 2.6162 | 27 20 53.9 | 5.601 | 21 | 6 50 53.47 | 2.6777 | 28 6 24.5 | 3.821 |
| 22 | 4 44 51.39 | 2.6213 | 27 26 24.5 | 5.418 | 22 | 6 53 34.04 | 2.6747 | 28 2 29.4 | 4.016 |
| 23 | 4 47 28.82 | 2.6263 | 27 31 44.1 | 5.234 | 23 | 6 56 14.43 | 2.6715 | 27 58 22.6 | 4.210 |
| 24 | 4 50 6.55 | 2.6312 | N.27 36 52.6 | 5.049 | 24 | 6 58 54.62 | 2.6681 | N.27 54 4.2 | 4.403 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | SUNDAY 5. | | | | | TUESDAY 7. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 6 58 54.62 | 2.6681 | N.27 54 4.2 | 4.403 | 0 | 9 0 49.83 | 2.3819 | N.21 2 54.6 | 12.139 |
| 1 | 7 1 34.60 | 2.6647 | 27 49 34.2 | 4.596 | 1 | 9 3 12.53 | 2.3748 | 20 50 42.6 | 12.260 |
| 2 | 7 4 14.37 | 2.6611 | 27 44 52.7 | 4.788 | 2 | 9 5 34.81 | 2.3678 | 20 38 23.4 | 12.379 |
| 3 | 7 6 53.92 | 2.6573 | 27 39 59.6 | 4.980 | 3 | 9 7 56.67 | 2.3607 | 20 25 57.1 | 12.496 |
| 4 | 7 9 33.24 | 2.6533 | 27 34 55.1 | 5.169 | 4 | 9 10 18.10 | 2.3536 | 20 13 23.9 | 12.610 |
| 5 | 7 12 12.31 | 2.6491 | 27 29 39.3 | 5.358 | 5 | 9 12 39.10 | 2.3464 | 20 0 43.9 | 12.722 |
| 6 | 7 14 51.13 | 2.6448 | 27 24 12.1 | 5.547 | 6 | 9 14 59.67 | 2.3393 | 19 47 57.3 | 12.832 |
| 7 | 7 17 29.69 | 2.6404 | 27 18 33.7 | 5.733 | 7 | 9 17 19.82 | 2.3323 | 19 35 4.1 | 12.942 |
| 8 | 7 20 7.98 | 2.6359 | 27 12 44.2 | 5.918 | 8 | 9 19 39.55 | 2.3252 | 19 22 4.3 | 13.050 |
| 9 | 7 22 46.00 | 2.6313 | 27 6 43.5 | 6.103 | 9 | 9 21 58.85 | 2.3182 | 19 8 58.1 | 13.155 |
| 10 | 7 25 23.74 | 2.6265 | 27 0 31.8 | 6.287 | 10 | 9 24 17.73 | 2.3113 | 18 55 45.7 | 13.258 |
| 11 | 7 28 1.18 | 2.6215 | 26 54 9.1 | 6.468 | 11 | 9 26 36.20 | 2.3044 | 18 42 27.1 | 13.360 |
| 12 | 7 30 38.32 | 2.6164 | 26 47 35.6 | 6.649 | 12 | 9 28 54.26 | 2.2975 | 18 29 2.5 | 13.459 |
| 13 | 7 33 15.15 | 2.6113 | 26 40 51.2 | 6.829 | 13 | 9 31 11.90 | 2.2906 | 18 15 32.0 | 13.557 |
| 14 | 7 35 51.67 | 2.6061 | 26 33 56.1 | 7.007 | 14 | 9 33 29.13 | 2.2837 | 18 1 55.7 | 13.653 |
| 15 | 7 38 27.88 | 2.6007 | 26 26 50.3 | 7.185 | 15 | 9 35 45.94 | 2.2769 | 17 48 13.6 | 13.748 |
| 16 | 7 41 3.76 | 2.5951 | 26 19 33.9 | 7.361 | 16 | 9 38 2.35 | 2.2701 | 17 34 25.9 | 13.840 |
| 17 | 7 43 39.30 | 2.5894 | 26 12 7.0 | 7.535 | 17 | 9 40 18.35 | 2.2633 | 17 20 32.8 | 13.929 |
| 18 | 7 46 14.49 | 2.5836 | 26 4 29.7 | 7.707 | 18 | 9 42 33.95 | 2.2567 | 17 6 34.4 | 14.017 |
| 19 | 7 48 49.33 | 2.5779 | 25 56 42.1 | 7.878 | 19 | 9 44 49.15 | 2.2500 | 16 52 30.7 | 14.104 |
| 20 | 7 51 23.83 | 2.5721 | 25 48 44.3 | 8.049 | 20 | 9 47 3.95 | 2.2433 | 16 38 21.9 | 14.189 |
| 21 | 7 53 57.98 | 2.5661 | 25 40 36.2 | 8.219 | 21 | 9 49 18.35 | 2.2367 | 16 24 8.0 | 14.272 |
| 22 | 7 56 31.76 | 2.5599 | 25 32 18.0 | 8.386 | 22 | 9 51 32.36 | 2.2303 | 16 9 49.2 | 14.353 |
| 23 | 7 59 5.17 | 2.5537 | N.25 23 49.9 | 8.550 | 23 | 9 53 45.99 | 2.2239 | N.15 55 25.6 | 14.433 |
| | MONDAY 6. | | | | | WEDNESDAY 8. | | | |
| 0 | 8 1 38.21 | 2.5475 | N.25 15 12.0 | 8.714 | 0 | 9 55 59.23 | 2.2175 | N.15 40 57.2 | 14.512 |
| 1 | 8 4 10.87 | 2.5411 | 25 6 24.3 | 8.877 | 1 | 9 58 12.09 | 2.2111 | 15 26 24.2 | 14.587 |
| 2 | 8 6 43.14 | 2.5347 | 24 57 26.8 | 9.038 | 2 | 10 0 24.57 | 2.2048 | 15 11 46.8 | 14.659 |
| 3 | 8 9 15.03 | 2.5282 | 24 48 19.7 | 9.197 | 3 | 10 2 36.67 | 2.1986 | 14 57 5.1 | 14.731 |
| 4 | 8 11 46.53 | 2.5216 | 24 39 3.1 | 9.355 | 4 | 10 4 48.40 | 2.1925 | 14 42 19.1 | 14.802 |
| 5 | 8 14 17.63 | 2.5149 | 24 29 37.1 | 9.510 | 5 | 10 6 59.77 | 2.1864 | 14 27 28.9 | 14.871 |
| 6 | 8 16 48.32 | 2.5082 | 24 20 1.9 | 9.664 | 6 | 10 9 10.77 | 2.1803 | 14 12 34.6 | 14.937 |
| 7 | 8 19 18.61 | 2.5015 | 24 10 17.4 | 9.817 | 7 | 10 11 21.41 | 2.1744 | 13 57 36.4 | 15.002 |
| 8 | 8 21 48.50 | 2.4948 | 24 0 23.8 | 9.968 | 8 | 10 13 31.70 | 2.1685 | 13 42 34.4 | 15.065 |
| 9 | 8 24 17.99 | 2.4881 | 23 50 21.2 | 10.117 | 9 | 10 15 41.63 | 2.1626 | 13 27 28.6 | 15.127 |
| 10 | 8 26 47.07 | 2.4812 | 23 40 9.7 | 10.265 | 10 | 10 17 51.21 | 2.1568 | 13 12 19.2 | 15.187 |
| 11 | 8 29 15.73 | 2.4742 | 23 29 49.4 | 10.410 | 11 | 10 20 0.45 | 2.1511 | 12 57 6.2 | 15.245 |
| 12 | 8 31 43.97 | 2.4672 | 23 19 20.5 | 10.553 | 12 | 10 22 9.34 | 2.1454 | 12 41 49.8 | 15.301 |
| 13 | 8 34 11.80 | 2.4602 | 23 8 43.0 | 10.696 | 13 | 10 24 17.89 | 2.1398 | 12 26 30.1 | 15.355 |
| 14 | 8 36 39.20 | 2.4532 | 22 57 57.0 | 10.837 | 14 | 10 26 26.12 | 2.1344 | 12 11 7.2 | 15.408 |
| 15 | 8 39 6.18 | 2.4462 | 22 47 2.6 | 10.975 | 15 | 10 28 34.02 | 2.1290 | 11 55 41.1 | 15.460 |
| 16 | 8 41 32.74 | 2.4391 | 22 36 0.0 | 11.112 | 16 | 10 30 41.60 | 2.1236 | 11 40 12.0 | 15.508 |
| 17 | 8 43 58.87 | 2.4319 | 22 24 49.2 | 11.247 | 17 | 10 32 48.85 | 2.1183 | 11 24 40.1 | 15.555 |
| 18 | 8 46 24.57 | 2.4248 | 22 13 30.3 | 11.381 | 18 | 10 34 55.79 | 2.1131 | 11 9 5.4 | 15.601 |
| 19 | 8 48 49.85 | 2.4177 | 22 2 3.5 | 11.512 | 19 | 10 37 2.42 | 2.1079 | 10 53 28.0 | 15.646 |
| 20 | 8 51 14.70 | 2.4107 | 21 50 28.9 | 11.641 | 20 | 10 39 8.74 | 2.1028 | 10 37 47.9 | 15.689 |
| 21 | 8 53 39.13 | 2.4036 | 21 38 46.6 | 11.768 | 21 | 10 41 14.76 | 2.0978 | 10 22 5.3 | 15.730 |
| 22 | 8 56 3.13 | 2.3964 | 21 26 56.7 | 11.894 | 22 | 10 43 20.48 | 2.0929 | 10 6 20.3 | 15.769 |
| 23 | 8 58 26.70 | 2.3891 | 21 14 59.3 | 12.017 | 23 | 10 45 25.91 | 2.0881 | 9 50 33.0 | 15.807 |
| 24 | 9 0 49.83 | 2.3819 | N.21 2 54.6 | 12.139 | 24 | 10 47 31.05 | 2.0833 | N. 9 34 43.4 | 15.844 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### THURSDAY 9.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 10 47 31.05 | 2.0833 | N. 9 34 43.4 | 15.844 |
| 1 | 10 49 35.90 | 2.0786 | 9 18 51.7 | 15.878 |
| 2 | 10 51 40.48 | 2.0740 | 9 2 58.0 | 15.911 |
| 3 | 10 53 44.78 | 2.0694 | 8 47 2.4 | 15.942 |
| 4 | 10 55 48.81 | 2.0650 | 8 31 5.0 | 15.972 |
| 5 | 10 57 52.58 | 2.0606 | 8 15 5.8 | 16.001 |
| 6 | 10 59 56.09 | 2.0563 | 7 59 4.9 | 16.027 |
| 7 | 11 1 59.34 | 2.0521 | 7 43 2.5 | 16.052 |
| 8 | 11 4 2.34 | 2.0479 | 7 26 58.6 | 16.076 |
| 9 | 11 6 5.09 | 2.0438 | 7 10 53.4 | 16.098 |
| 10 | 11 8 7.60 | 2.0399 | 6 54 46.9 | 16.118 |
| 11 | 11 10 9.88 | 2.0360 | 6 38 39.2 | 16.136 |
| 12 | 11 12 11.92 | 2.0321 | 6 22 30.5 | 16.153 |
| 13 | 11 14 13.73 | 2.0283 | 6 6 20.8 | 16.170 |
| 14 | 11 16 15.32 | 2.0247 | 5 50 10.1 | 16.186 |
| 15 | 11 18 16.70 | 2.0212 | 5 33 58.5 | 16.199 |
| 16 | 11 20 17.87 | 2.0177 | 5 17 46.2 | 16.210 |
| 17 | 11 22 18.82 | 2.0142 | 5 1 33.3 | 16.220 |
| 18 | 11 24 19.57 | 2.0108 | 4 45 19.8 | 16.229 |
| 19 | 11 26 20.12 | 2.0076 | 4 29 5.8 | 16.237 |
| 20 | 11 28 20.48 | 2.0044 | 4 12 51.4 | 16.242 |
| 21 | 11 30 20.65 | 2.0013 | 3 56 36.8 | 16.246 |
| 22 | 11 32 20.64 | 1.9982 | 3 40 21.9 | 16.250 |
| 23 | 11 34 20.44 | 1.9952 | N. 3 24 6.8 | 16.252 |

### FRIDAY 10.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 11 36 20.07 | 1.9924 | N. 3 7 51.7 | 16.252 |
| 1 | 11 38 19.53 | 1.9897 | 2 51 36.6 | 16.251 |
| 2 | 11 40 18.83 | 1.9870 | 2 35 21.6 | 16.248 |
| 3 | 11 42 17.97 | 1.9844 | 2 19 6.8 | 16.244 |
| 4 | 11 44 16.96 | 1.9818 | 2 2 52.3 | 16.239 |
| 5 | 11 46 15.79 | 1.9793 | 1 46 38.1 | 16.233 |
| 6 | 11 48 14.48 | 1.9770 | 1 30 24.3 | 16.226 |
| 7 | 11 50 13.03 | 1.9747 | 1 14 11.0 | 16.217 |
| 8 | 11 52 11.44 | 1.9724 | 0 57 58.3 | 16.206 |
| 9 | 11 54 9.72 | 1.9702 | 0 41 46.3 | 16.194 |
| 10 | 11 56 7.87 | 1.9682 | 0 25 35.1 | 16.181 |
| 11 | 11 58 5.90 | 1.9663 | N. 0 9 24.6 | 16.167 |
| 12 | 12 0 3.82 | 1.9644 | S. 0 6 45.0 | 16.151 |
| 13 | 12 2 1.63 | 1.9625 | 0 22 53.6 | 16.134 |
| 14 | 12 3 59.32 | 1.9607 | 0 39 1.1 | 16.117 |
| 15 | 12 5 56.91 | 1.9590 | 0 55 7.6 | 16.098 |
| 16 | 12 7 54.40 | 1.9574 | 1 11 12.9 | 16.077 |
| 17 | 12 9 51.80 | 1.9560 | 1 27 16.9 | 16.056 |
| 18 | 12 11 49.12 | 1.9546 | 1 43 19.6 | 16.033 |
| 19 | 12 13 46.35 | 1.9532 | 1 59 20.9 | 16.009 |
| 20 | 12 15 43.50 | 1.9518 | 2 15 20.7 | 15.983 |
| 21 | 12 17 40.57 | 1.9506 | 2 31 18.9 | 15.957 |
| 22 | 12 19 37.57 | 1.9495 | 2 47 15.5 | 15.929 |
| 23 | 12 21 34.51 | 1.9484 | 3 3 10.4 | 15.901 |
| 24 | 12 23 31.38 | 1.9474 | S. 3 19 3.6 | 15.871 |

### SATURDAY 11.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 12 23 31.38 | 1.9474 | S. 3 19 3.6 | 15.871 |
| 1 | 12 25 28.20 | 1.9466 | 3 34 54.9 | 15.839 |
| 2 | 12 27 24.97 | 1.9457 | 3 50 44.3 | 15.807 |
| 3 | 12 29 21.68 | 1.9449 | 4 6 31.8 | 15.774 |
| 4 | 12 31 18.35 | 1.9443 | 4 22 17.2 | 15.739 |
| 5 | 12 33 14.99 | 1.9437 | 4 38 0.5 | 15.704 |
| 6 | 12 35 11.59 | 1.9431 | 4 53 41.7 | 15.667 |
| 7 | 12 37 8.16 | 1.9426 | 5 9 20.6 | 15.629 |
| 8 | 12 39 4.70 | 1.9422 | 5 24 57.2 | 15.591 |
| 9 | 12 41 1.22 | 1.9418 | 5 40 31.5 | 15.551 |
| 10 | 12 42 57.72 | 1.9416 | 5 56 3.3 | 15.509 |
| 11 | 12 44 54.21 | 1.9414 | 6 11 32.6 | 15.467 |
| 12 | 12 46 50.69 | 1.9413 | 6 26 59.4 | 15.424 |
| 13 | 12 48 47.17 | 1.9412 | 6 42 23.5 | 15.379 |
| 14 | 12 50 43.64 | 1.9412 | 6 57 44.9 | 15.334 |
| 15 | 12 52 40.12 | 1.9414 | 7 13 3.6 | 15.288 |
| 16 | 12 54 36.61 | 1.9416 | 7 28 19.5 | 15.241 |
| 17 | 12 56 33.11 | 1.9417 | 7 43 32.5 | 15.192 |
| 18 | 12 58 29.61 | 1.9419 | 7 58 42.6 | 15.143 |
| 19 | 13 0 26.13 | 1.9423 | 8 13 49.7 | 15.092 |
| 20 | 13 2 22.68 | 1.9428 | 8 28 53.7 | 15.041 |
| 21 | 13 4 19.27 | 1.9434 | 8 43 54.6 | 14.988 |
| 22 | 13 6 15.89 | 1.9439 | 8 58 52.3 | 14.935 |
| 23 | 13 8 12.54 | 1.9444 | S. 9 13 46.8 | 14.880 |

### SUNDAY 12.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 13 10 9.22 | 1.9451 | S. 9 28 37.9 | 14.823 |
| 1 | 13 12 5.95 | 1.9459 | 9 43 25.6 | 14.767 |
| 2 | 13 14 2.73 | 1.9467 | 9 58 10.0 | 14.711 |
| 3 | 13 15 59.56 | 1.9476 | 10 12 50.9 | 14.653 |
| 4 | 13 17 56.44 | 1.9485 | 10 27 28.3 | 14.593 |
| 5 | 13 19 53.38 | 1.9495 | 10 42 2.1 | 14.532 |
| 6 | 13 21 50.38 | 1.9506 | 10 56 32.2 | 14.471 |
| 7 | 13 23 47.45 | 1.9517 | 11 10 58.6 | 14.409 |
| 8 | 13 25 44.59 | 1.9528 | 11 25 21.3 | 14.346 |
| 9 | 13 27 41.79 | 1.9540 | 11 39 40.1 | 14.281 |
| 10 | 13 29 39.07 | 1.9553 | 11 53 55.0 | 14.216 |
| 11 | 13 31 36.43 | 1.9567 | 12 8 6.0 | 14.151 |
| 12 | 13 33 33.88 | 1.9581 | 12 22 13.1 | 14.084 |
| 13 | 13 35 31.41 | 1.9596 | 12 36 16.1 | 14.016 |
| 14 | 13 37 29.03 | 1.9612 | 12 50 15.0 | 13.947 |
| 15 | 13 39 26.75 | 1.9628 | 13 4 9.7 | 13.877 |
| 16 | 13 41 24.57 | 1.9644 | 13 18 0.2 | 13.807 |
| 17 | 13 43 22.48 | 1.9660 | 13 31 46.5 | 13.735 |
| 18 | 13 45 20.49 | 1.9677 | 13 45 28.4 | 13.662 |
| 19 | 13 47 18.61 | 1.9696 | 13 59 5.9 | 13.589 |
| 20 | 13 49 16.84 | 1.9715 | 14 12 39.1 | 13.516 |
| 21 | 13 51 15.19 | 1.9734 | 14 26 7.8 | 13.440 |
| 22 | 13 53 13.65 | 1.9753 | 14 39 31.9 | 13.364 |
| 23 | 13 55 12.23 | 1.9772 | 14 52 51.4 | 13.288 |
| 24 | 13 57 10.92 | 1.9793 | S. 15 6 6.4 | 13.211 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | MONDAY 13. | | | | | WEDNESDAY 15. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 13 57 10.92 | 1.9793 | S.15 6 6.4 | 13.211 | 0 | 15 35 14.37 | 2.1154 | S.23 55 19.5 | 8.547 |
| 1 | 13 59 9.74 | 1.9814 | 15 19 16.7 | 13.132 | 1 | 15 37 21.39 | 2.1186 | 24 3 48.9 | 8.432 |
| 2 | 14 1 8.69 | 1.9836 | 15 32 22.2 | 13.052 | 2 | 15 39 28.60 | 2.1218 | 24 12 11.4 | 8.317 |
| 3 | 14 3 7.77 | 1.9858 | 15 45 22.9 | 12.971 | 3 | 15 41 36.01 | 2.1250 | 24 20 27.0 | 8.201 |
| 4 | 14 5 6.98 | 1.9880 | 15 58 18.7 | 12.890 | 4 | 15 43 43.60 | 2.1281 | 24 28 35.6 | 8.084 |
| 5 | 14 7 6.33 | 1.9902 | 16 11 9.7 | 12.809 | 5 | 15 45 51.38 | 2.1312 | 24 36 37.1 | 7.967 |
| 6 | 14 9 5.81 | 1.9925 | 16 23 55.8 | 12.727 | 6 | 15 47 59.34 | 2.1343 | 24 44 31.6 | 7.849 |
| 7 | 14 11 5.43 | 1.9949 | 16 36 36.9 | 12.643 | 7 | 15 50 7.49 | 2.1374 | 24 52 19.0 | 7.730 |
| 8 | 14 13 5.20 | 1.9974 | 16 49 12.9 | 12.558 | 8 | 15 52 15.83 | 2.1405 | 24 59 59.2 | 7.610 |
| 9 | 14 15 5.12 | 1.9998 | 17 1 43.9 | 12.474 | 9 | 15 54 24.35 | 2.1435 | 25 7 32.2 | 7.490 |
| 10 | 14 17 5.18 | 2.0022 | 17 14 9.8 | 12.388 | 10 | 15 56 33.05 | 2.1466 | 25 14 58.0 | 7.370 |
| 11 | 14 19 5.39 | 2.0047 | 17 26 30.4 | 12.300 | 11 | 15 58 41.94 | 2.1497 | 25 22 16.6 | 7.250 |
| 12 | 14 21 5.75 | 2.0073 | 17 38 45.8 | 12.212 | 12 | 16 0 51.01 | 2.1527 | 25 29 28.0 | 7.129 |
| 13 | 14 23 6.27 | 2.0099 | 17 50 55.9 | 12.124 | 13 | 16 3 0.26 | 2.1557 | 25 36 32.1 | 7.006 |
| 14 | 14 25 6.94 | 2.0125 | 18 3 0.7 | 12.035 | 14 | 16 5 9.69 | 2.1586 | 25 43 28.7 | 6.882 |
| 15 | 14 27 7.77 | 2.0152 | 18 15 0.1 | 11.945 | 15 | 16 7 19.29 | 2.1615 | 25 50 17.9 | 6.758 |
| 16 | 14 29 8.76 | 2.0179 | 18 26 54.1 | 11.854 | 16 | 16 9 29.07 | 2.1644 | 25 56 59.7 | 6.635 |
| 17 | 14 31 9.92 | 2.0207 | 18 38 42.6 | 11.762 | 17 | 16 11 39.02 | 2.1673 | 26 3 34.1 | 6.511 |
| 18 | 14 33 11.24 | 2.0234 | 18 50 25.6 | 11.670 | 18 | 16 13 49.15 | 2.1702 | 26 10 1.0 | 6.386 |
| 19 | 14 35 12.73 | 2.0262 | 19 2 3.0 | 11.577 | 19 | 16 15 59.45 | 2.1730 | 26 16 20.4 | 6.260 |
| 20 | 14 37 14.39 | 2.0290 | 19 13 34.8 | 11.482 | 20 | 16 18 9.91 | 2.1757 | 26 22 32.2 | 6.133 |
| 21 | 14 39 16.21 | 2.0318 | 19 25 0.9 | 11.387 | 21 | 16 20 20.54 | 2.1785 | 26 28 36.4 | 6.007 |
| 22 | 14 41 18.20 | 2.0347 | 19 36 21.3 | 11.292 | 22 | 16 22 31.33 | 2.1813 | 26 34 33.0 | 5.880 |
| 23 | 14 43 20.37 | 2.0377 | S.19 47 36.0 | 11.196 | 23 | 16 24 42.29 | 2.1840 | S.26 40 22.0 | 5.753 |
| | TUESDAY 14. | | | | | THURSDAY 16. | | | |
| 0 | 14 45 22.72 | 2.0406 | S.19 58 44.8 | 11.098 | 0 | 16 26 53.41 | 2.1866 | S.26 46 3.4 | 5.626 |
| 1 | 14 47 25.24 | 2.0435 | 20 9 47.7 | 11.000 | 1 | 16 29 4.68 | 2.1892 | 26 51 37.1 | 5.497 |
| 2 | 14 49 27.94 | 2.0465 | 20 20 44.8 | 10.902 | 2 | 16 31 16.11 | 2.1918 | 26 57 3.0 | 5.367 |
| 3 | 14 51 30.82 | 2.0495 | 20 31 36.0 | 10.803 | 3 | 16 33 27.69 | 2.1943 | 27 2 21.1 | 5.237 |
| 4 | 14 53 33.88 | 2.0525 | 20 42 21.2 | 10.702 | 4 | 16 35 39.42 | 2.1968 | 27 7 31.4 | 5.107 |
| 5 | 14 55 37.12 | 2.0556 | 20 53 0.3 | 10.601 | 5 | 16 37 51.30 | 2.1992 | 27 12 33.9 | 4.977 |
| 6 | 14 57 40.55 | 2.0587 | 21 3 33.3 | 10.499 | 6 | 16 40 3.32 | 2.2015 | 27 17 28.6 | 4.846 |
| 7 | 14 59 44.16 | 2.0617 | 21 14 0.2 | 10.397 | 7 | 16 42 15.48 | 2.2039 | 27 22 15.4 | 4.714 |
| 8 | 15 1 47.95 | 2.0648 | 21 24 20.9 | 10.294 | 8 | 16 44 27.78 | 2.2063 | 27 26 54.3 | 4.583 |
| 9 | 15 3 51.93 | 2.0679 | 21 34 35.5 | 10.191 | 9 | 16 46 40.23 | 2.2086 | 27 31 25.3 | 4.451 |
| 10 | 15 5 56.10 | 2.0711 | 21 44 43.8 | 10.086 | 10 | 16 48 52.81 | 2.2107 | 27 35 48.4 | 4.318 |
| 11 | 15 8 0.46 | 2.0742 | 21 54 45.8 | 9.981 | 11 | 16 51 5.51 | 2.2127 | 27 40 3.5 | 4.185 |
| 12 | 15 10 5.00 | 2.0773 | 22 4 41.5 | 9.875 | 12 | 16 53 18.33 | 2.2147 | 27 44 10.6 | 4.052 |
| 13 | 15 12 9.73 | 2.0804 | 22 14 30.8 | 9.768 | 13 | 16 55 31.28 | 2.2168 | 27 48 9.7 | 3.918 |
| 14 | 15 14 14.65 | 2.0837 | 22 24 13.6 | 9.660 | 14 | 16 57 44.35 | 2.2189 | 27 52 0.8 | 3.784 |
| 15 | 15 16 19.77 | 2.0869 | 22 33 50.0 | 9.552 | 15 | 16 59 57.55 | 2.2209 | 27 55 43.8 | 3.649 |
| 16 | 15 18 25.08 | 2.0900 | 22 43 19.9 | 9.443 | 16 | 17 2 10.86 | 2.2227 | 27 59 18.7 | 3.514 |
| 17 | 15 20 30.57 | 2.0931 | 22 52 43.2 | 9.333 | 17 | 17 4 24.27 | 2.2244 | 28 2 45.5 | 3.380 |
| 18 | 15 22 36.25 | 2.0963 | 23 1 59.9 | 9.223 | 18 | 17 6 37.79 | 2.2262 | 28 6 4.3 | 3.245 |
| 19 | 15 24 42.12 | 2.0995 | 23 11 10.0 | 9.112 | 19 | 17 8 51.41 | 2.2279 | 28 9 14.9 | 3.109 |
| 20 | 15 26 48.19 | 2.1027 | 23 20 13.4 | 9.001 | 20 | 17 11 5.13 | 2.2296 | 28 12 17.3 | 2.973 |
| 21 | 15 28 54.45 | 2.1059 | 23 29 10.1 | 8.889 | 21 | 17 13 18.96 | 2.2313 | 28 15 11.6 | 2.837 |
| 22 | 15 31 0.90 | 2.1091 | 23 38 0.0 | 8.776 | 22 | 17 15 32.88 | 2.2327 | 28 17 57.7 | 2.700 |
| 23 | 15 33 7.54 | 2.1122 | 23 46 43.2 | 8.662 | 23 | 17 17 46.88 | 2.2340 | 28 20 35.6 | 2.563 |
| 24 | 15 35 14.37 | 2.1154 | S.23 55 19.5 | 8.547 | 24 | 17 20 0.96 | 2.2354 | S.28 23 5.3 | 2.426 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | FRIDAY 17. | | | | | SUNDAY 19. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 17 20 0.96 | 2.2354 | S.28 23 5.3 | 2.426 | 0 | 19 7 36.13 | 2.2208 | S.27 39 46.4 | 4.210 |
| 1 | 17 22 15.12 | 2.2368 | 28 25 26.7 | 2.289 | 1 | 19 9 49.32 | 2.2189 | 27 35 29.8 | 4.344 |
| 2 | 17 24 29.37 | 2.2381 | 28 27 39.9 | 2.152 | 2 | 19 12 2.40 | 2.2170 | 27 31 5.1 | 4.478 |
| 3 | 17 26 43.69 | 2.2392 | 28 29 44.9 | 2.014 | 3 | 19 14 15.36 | 2.2150 | 27 26 32.4 | 4.612 |
| 4 | 17 28 58.08 | 2.2403 | 28 31 41.6 | 1.876 | 4 | 19 16 28.20 | 2.2129 | 27 21 51.7 | 4.745 |
| 5 | 17 31 12.53 | 2.2414 | 28 33 30.0 | 1.737 | 5 | 19 18 40.91 | 2.2108 | 27 17 3.0 | 4.878 |
| 6 | 17 33 27.05 | 2.2424 | 28 35 10.1 | 1.599 | 6 | 19 20 53.50 | 2.2087 | 27 12 6.3 | 5.011 |
| 7 | 17 35 41.62 | 2.2433 | 28 36 41.9 | 1.461 | 7 | 19 23 5.96 | 2.2065 | 27 7 1.7 | 5.143 |
| 8 | 17 37 56.24 | 2.2442 | 28 38 5.4 | 1.322 | 8 | 19 25 18.28 | 2.2042 | 27 1 49.2 | 5.275 |
| 9 | 17 40 10.92 | 2.2450 | 28 39 20.5 | 1.183 | 9 | 19 27 30.46 | 2.2018 | 26 56 28.7 | 5.407 |
| 10 | 17 42 25.64 | 2.2456 | 28 40 27.3 | 1.044 | 10 | 19 29 42.50 | 2.1995 | 26 51 0.4 | 5.537 |
| 11 | 17 44 40.39 | 2.2462 | 28 41 25.8 | 0.906 | 11 | 19 31 54.40 | 2.1972 | 26 45 24.3 | 5.667 |
| 12 | 17 46 55.18 | 2.2468 | 28 42 16.0 | 0.767 | 12 | 19 34 6.16 | 2.1947 | 26 39 40.4 | 5.797 |
| 13 | 17 49 10.00 | 2.2473 | 28 42 57.8 | 0.627 | 13 | 19 36 17.77 | 2.1922 | 26 33 48.7 | 5.927 |
| 14 | 17 51 24.85 | 2.2478 | 28 43 31.2 | 0.487 | 14 | 19 38 29.23 | 2.1897 | 26 27 49.2 | 6.056 |
| 15 | 17 53 39.73 | 2.2482 | 28 43 56.3 | 0.348 | 15 | 19 40 40.53 | 2.1871 | 26 21 42.0 | 6.184 |
| 16 | 17 55 54.63 | 2.2484 | 28 44 13.0 | 0.208 | 16 | 19 42 51.68 | 2.1846 | 26 15 27.1 | 6.313 |
| 17 | 17 58 9.54 | 2.2486 | 28 44 21.3 | −0.069 | 17 | 19 45 2.68 | 2.1820 | 26 9 4.5 | 6.441 |
| 18 | 18 0 24.46 | 2.2487 | 28 44 21.3 | +0.070 | 18 | 19 47 13.52 | 2.1793 | 26 2 34.2 | 6.568 |
| 19 | 18 2 39.39 | 2.2488 | 28 44 12.9 | 0.210 | 19 | 19 49 24.20 | 2.1766 | 25 55 56.3 | 6.694 |
| 20 | 18 4 54.32 | 2.2487 | 28 43 56.1 | 0.350 | 20 | 19 51 34.71 | 2.1738 | 25 49 10.9 | 6.819 |
| 21 | 18 7 9.24 | 2.2487 | 28 43 30.9 | 0.490 | 21 | 19 53 45.06 | 2.1711 | 25 42 18.0 | 6.944 |
| 22 | 18 9 24.16 | 2.2486 | 28 42 57.3 | 0.629 | 22 | 19 55 55.24 | 2.1683 | 25 35 17.6 | 7.070 |
| 23 | 18 11 39.07 | 2.2484 | S.28 42 15.4 | 0.768 | 23 | 19 58 5.26 | 2.1656 | S.25 28 9.6 | 7.195 |
| | SATURDAY 18. | | | | | MONDAY 20. | | | |
| 0 | 18 13 53.97 | 2.2482 | S.28 41 25.1 | 0.908 | 0 | 20 0 15.11 | 2.1627 | S.25 20 54.2 | 7.318 |
| 1 | 18 16 8.85 | 2.2478 | 28 40 26.4 | 1.047 | 1 | 20 2 24.79 | 2.1598 | 25 13 31.4 | 7.442 |
| 2 | 18 18 23.70 | 2.2473 | 28 39 19.4 | 1.187 | 2 | 20 4 34.29 | 2.1569 | 25 6 1.2 | 7.564 |
| 3 | 18 20 38.52 | 2.2468 | 28 38 4.0 | 1.326 | 3 | 20 6 43.62 | 2.1540 | 24 58 23.7 | 7.686 |
| 4 | 18 22 53.31 | 2.2462 | 28 36 40.3 | 1.465 | 4 | 20 8 52.77 | 2.1511 | 24 50 38.9 | 7.807 |
| 5 | 18 25 8.06 | 2.2456 | 28 35 8.2 | 1.604 | 5 | 20 11 1.75 | 2.1482 | 24 42 46.8 | 7.929 |
| 6 | 18 27 22.78 | 2.2449 | 28 33 27.8 | 1.743 | 6 | 20 13 10.55 | 2.1452 | 24 34 47.4 | 8.050 |
| 7 | 18 29 37.45 | 2.2441 | 28 31 39.1 | 1.882 | 7 | 20 15 19.17 | 2.1422 | 24 26 40.8 | 8.169 |
| 8 | 18 31 52.07 | 2.2432 | 28 29 42.0 | 2.021 | 8 | 20 17 27.61 | 2.1392 | 24 18 27.1 | 8.287 |
| 9 | 18 34 6.64 | 2.2423 | 28 27 36.6 | 2.159 | 9 | 20 19 35.87 | 2.1362 | 24 10 6.3 | 8.406 |
| 10 | 18 36 21.15 | 2.2413 | 28 25 22.9 | 2.297 | 10 | 20 21 43.95 | 2.1332 | 24 1 38.4 | 8.524 |
| 11 | 18 38 35.60 | 2.2402 | 28 23 0.9 | 2.435 | 11 | 20 23 51.85 | 2.1301 | 23 53 3.4 | 8.642 |
| 12 | 18 40 49.98 | 2.2391 | 28 20 30.7 | 2.573 | 12 | 20 25 59.56 | 2.1270 | 23 44 21.4 | 8.758 |
| 13 | 18 43 4.29 | 2.2379 | 28 17 52.2 | 2.711 | 13 | 20 28 7.09 | 2.1240 | 23 35 32.5 | 8.873 |
| 14 | 18 45 18.53 | 2.2367 | 28 15 5.4 | 2.848 | 14 | 20 30 14.44 | 2.1210 | 23 26 36.6 | 8.989 |
| 15 | 18 47 32.70 | 2.2355 | 28 12 10.4 | 2.986 | 15 | 20 32 21.61 | 2.1179 | 23 17 33.8 | 9.104 |
| 16 | 18 49 46.79 | 2.2341 | 28 9 7.1 | 3.123 | 16 | 20 34 28.59 | 2.1148 | 23 8 24.1 | 9.217 |
| 17 | 18 52 0.79 | 2.2326 | 28 5 55.6 | 3.260 | 17 | 20 36 35.39 | 2.1117 | 22 59 7.7 | 9.330 |
| 18 | 18 54 14.70 | 2.2311 | 28 2 35.9 | 3.397 | 18 | 20 38 42.00 | 2.1087 | 22 49 44.5 | 9.442 |
| 19 | 18 56 28.52 | 2.2296 | 27 59 8.0 | 3.533 | 19 | 20 40 48.43 | 2.1057 | 22 40 14.6 | 9.555 |
| 20 | 18 58 42.25 | 2.2280 | 27 55 31.9 | 3.669 | 20 | 20 42 54.68 | 2.1026 | 22 30 37.9 | 9.667 |
| 21 | 19 0 55.88 | 2.2263 | 27 51 47.7 | 3.804 | 21 | 20 45 0.74 | 2.0995 | 22 20 54.6 | 9.777 |
| 22 | 19 3 9.40 | 2.2245 | 27 47 55.4 | 3.939 | 22 | 20 47 6.62 | 2.0965 | 22 11 4.7 | 9.886 |
| 23 | 19 5 22.82 | 2.2227 | 27 43 55.0 | 4.075 | 23 | 20 49 12.32 | 2.0934 | 22 1 8.3 | 9.995 |
| 24 | 19 7 36.13 | 2.2208 | S.27 39 46.4 | 4.210 | 24 | 20 51 17.83 | 2.0903 | S.21 51 5.3 | 10.104 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | TUESDAY 21. | | | | | THURSDAY 23. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 20 51 17.83 | 2.0903 | S. 21 51 5.3 | 10.104 | 0 | 22 28 33.28 | 1.9758 | S. 11 56 20.7 | 14.352 |
| 1 | 20 53 23.16 | 2.0873 | 21 40 55.8 | 10.212 | 1 | 22 30 31.79 | 1.9745 | 11 41 57.6 | 14.418 |
| 2 | 20 55 28.31 | 2.0843 | 21 30 39.9 | 10.318 | 2 | 22 32 30.22 | 1.9732 | 11 27 30.5 | 14.485 |
| 3 | 20 57 33.28 | 2.0813 | 21 20 17.7 | 10.423 | 3 | 22 34 28.57 | 1.9719 | 11 12 59.4 | 14.550 |
| 4 | 20 59 38.07 | 2.0783 | 21 9 49.2 | 10.528 | 4 | 22 36 26.85 | 1.9708 | 10 58 24.5 | 14.613 |
| 5 | 21 1 42.68 | 2.0752 | 20 59 14.3 | 10.634 | 5 | 22 38 25.07 | 1.9698 | 10 43 45.8 | 14.676 |
| 6 | 21 3 47.10 | 2.0722 | 20 48 33.1 | 10.738 | 6 | 22 40 23.23 | 1.9688 | 10 29 3.4 | 14.737 |
| 7 | 21 5 51.35 | 2.0693 | 20 37 45.7 | 10.841 | 7 | 22 42 21.33 | 1.9678 | 10 14 17.3 | 14.798 |
| 8 | 21 7 55.42 | 2.0664 | 20 26 52.2 | 10.943 | 8 | 22 44 19.37 | 1.9668 | 9 59 27.6 | 14.858 |
| 9 | 21 9 59.32 | 2.0635 | 20 15 52.6 | 11.044 | 9 | 22 46 17.35 | 1.9659 | 9 44 34.3 | 14.917 |
| 10 | 21 12 3.04 | 2.0606 | 20 4 46.9 | 11.145 | 10 | 22 48 15.28 | 1.9652 | 9 29 37.5 | 14.974 |
| 11 | 21 14 6.59 | 2.0577 | 19 53 35.2 | 11.245 | 11 | 22 50 13.17 | 1.9646 | 9 14 37.4 | 15.030 |
| 12 | 21 16 9.97 | 2.0549 | 19 42 17.5 | 11.344 | 12 | 22 52 11.03 | 1.9640 | 8 59 33.9 | 15.086 |
| 13 | 21 18 13.18 | 2.0521 | 19 30 53.9 | 11.443 | 13 | 22 54 8.85 | 1.9633 | 8 44 27.1 | 15.141 |
| 14 | 21 20 16.22 | 2.0492 | 19 19 24.4 | 11.541 | 14 | 22 56 6.63 | 1.9627 | 8 29 17.0 | 15.195 |
| 15 | 21 22 19.08 | 2.0464 | 19 7 49.0 | 11.638 | 15 | 22 58 4.38 | 1.9623 | 8 14 3.7 | 15.247 |
| 16 | 21 24 21.78 | 2.0437 | 18 56 7.8 | 11.733 | 16 | 23 0 2.11 | 1.9620 | 7 58 47.3 | 15.298 |
| 17 | 21 26 24.32 | 2.0410 | 18 44 21.0 | 11.827 | 17 | 23 1 59.82 | 1.9617 | 7 43 27.9 | 15.349 |
| 18 | 21 28 26.70 | 2.0383 | 18 32 28.5 | 11.922 | 18 | 23 3 57.51 | 1.9614 | 7 28 5.4 | 15.399 |
| 19 | 21 30 28.92 | 2.0356 | 18 20 30.4 | 12.016 | 19 | 23 5 55.19 | 1.9611 | 7 12 40.0 | 15.447 |
| 20 | 21 32 30.98 | 2.0329 | 18 8 26.6 | 12.110 | 20 | 23 7 52.85 | 1.9609 | 6 57 11.8 | 15.493 |
| 21 | 21 34 32.87 | 2.0302 | 17 56 17.2 | 12.202 | 21 | 23 9 50.50 | 1.9608 | 6 41 40.8 | 15.539 |
| 22 | 21 36 34.61 | 2.0277 | 17 44 2.4 | 12.292 | 22 | 23 11 48.15 | 1.9609 | 6 26 7.1 | 15.583 |
| 23 | 21 38 36.20 | 2.0252 | S. 17 31 42.2 | 12.382 | 23 | 23 13 45.81 | 1.9611 | S. 6 10 30.8 | 15.627 |
| | WEDNESDAY 22. | | | | | FRIDAY 24. | | | |
| 0 | 21 40 37.64 | 2.0227 | S. 17 19 16.6 | 12.471 | 0 | 23 15 43.48 | 1.9612 | S. 5 54 51.8 | 15.671 |
| 1 | 21 42 38.93 | 2.0202 | 17 6 45.7 | 12.560 | 1 | 23 17 41.16 | 1.9614 | 5 39 10.3 | 15.712 |
| 2 | 21 44 40.07 | 2.0178 | 16 54 9.4 | 12.648 | 2 | 23 19 38.85 | 1.9617 | 5 23 26.4 | 15.752 |
| 3 | 21 46 41.07 | 2.0154 | 16 41 27.9 | 12.735 | 3 | 23 21 36.56 | 1.9621 | 5 7 40.0 | 15.792 |
| 4 | 21 48 41.92 | 2.0131 | 16 28 41.2 | 12.821 | 4 | 23 23 34.30 | 1.9626 | 4 51 51.3 | 15.830 |
| 5 | 21 50 42.64 | 2.0108 | 16 15 49.4 | 12.906 | 5 | 23 25 32.07 | 1.9630 | 4 36 0.4 | 15.867 |
| 6 | 21 52 43.22 | 2.0086 | 16 2 52.5 | 12.990 | 6 | 23 27 29.86 | 1.9635 | 4 20 7.3 | 15.902 |
| 7 | 21 54 43.67 | 2.0063 | 15 49 50.6 | 13.073 | 7 | 23 29 27.69 | 1.9642 | 4 4 12.1 | 15.937 |
| 8 | 21 56 43.98 | 2.0041 | 15 36 43.7 | 13.156 | 8 | 23 31 25.57 | 1.9650 | 3 48 14.9 | 15.970 |
| 9 | 21 58 44.16 | 2.0020 | 15 23 31.9 | 13.237 | 9 | 23 33 23.50 | 1.9658 | 3 32 15.7 | 16.002 |
| 10 | 22 0 44.22 | 1.9999 | 15 10 15.2 | 13.318 | 10 | 23 35 21.47 | 1.9667 | 3 16 14.6 | 16.033 |
| 11 | 22 2 44.15 | 1.9978 | 14 56 53.7 | 13.398 | 11 | 23 37 19.50 | 1.9677 | 3 0 11.7 | 16.063 |
| 12 | 22 4 43.96 | 1.9958 | 14 43 27.4 | 13.477 | 12 | 23 39 17.59 | 1.9687 | 2 44 7.0 | 16.092 |
| 13 | 22 6 43.65 | 1.9939 | 14 29 56.4 | 13.555 | 13 | 23 41 15.74 | 1.9698 | 2 28 0.6 | 16.120 |
| 14 | 22 8 43.23 | 1.9920 | 14 16 20.8 | 13.633 | 14 | 23 43 13.96 | 1.9710 | 2 11 52.6 | 16.145 |
| 15 | 22 10 42.69 | 1.9901 | 14 2 40.5 | 13.709 | 15 | 23 45 12.26 | 1.9723 | 1 55 43.2 | 16.169 |
| 16 | 22 12 42.04 | 1.9883 | 13 48 55.7 | 13.783 | 16 | 23 47 10.64 | 1.9736 | 1 39 32.3 | 16.193 |
| 17 | 22 14 41.29 | 1.9866 | 13 35 6.5 | 13.858 | 17 | 23 49 9.10 | 1.9750 | 1 23 20.0 | 16.216 |
| 18 | 22 16 40.43 | 1.9849 | 13 21 12.8 | 13.932 | 18 | 23 51 7.64 | 1.9765 | 1 7 6.4 | 16.237 |
| 19 | 22 18 39.47 | 1.9832 | 13 7 14.7 | 14.004 | 19 | 23 53 6.28 | 1.9781 | 0 50 51.6 | 16.257 |
| 20 | 22 20 38.41 | 1.9816 | 12 53 12.3 | 14.075 | 20 | 23 55 5.01 | 1.9797 | 0 34 35.6 | 16.276 |
| 21 | 22 22 37.26 | 1.9801 | 12 39 5.7 | 14.146 | 21 | 23 57 3.84 | 1.9814 | 0 18 18.5 | 16.293 |
| 22 | 22 24 36.02 | 1.9786 | 12 24 54.8 | 14.216 | 22 | 23 59 2.77 | 1.9832 | S. 0 2 0.4 | 16.309 |
| 23 | 22 26 34.69 | 1.9772 | 12 10 39.8 | 14.284 | 23 | 0 1 1.82 | 1.9851 | N. 0 14 18.6 | 16.323 |
| 24 | 22 28 33.28 | 1.9758 | S. 11 56 20.7 | 14.352 | 24 | 0 3 0.98 | 1.9870 | N. 0 30 38.4 | 16.337 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| **SATURDAY 25.** | | | | | **MONDAY 27.** | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 0 3 0.98 | 1.9870 | N. 0 30 38.4 | 16.337 | 0 | 1 42 9.54 | 2.1740 | N.13 22 49.9 | 15.242 |
| 1 | 0 5 0.26 | 1.9891 | 0 46 59.0 | 16.349 | 1 | 1 44 20.15 | 2.1797 | 13 38 2.6 | 15.179 |
| 2 | 0 6 59.67 | 1.9912 | 1 3 20.3 | 16.359 | 2 | 1 46 31.11 | 2.1855 | 13 53 11.4 | 15.113 |
| 3 | 0 8 59.20 | 1.9934 | 1 19 42.1 | 16.368 | 3 | 1 48 42.41 | 2.1913 | 14 8 16.2 | 15.047 |
| 4 | 0 10 58.87 | 1.9957 | 1 36 4.4 | 16.376 | 4 | 1 50 54.07 | 2.1973 | 14 23 17.0 | 14.979 |
| 5 | 0 12 58.68 | 1.9980 | 1 52 27.2 | 16.383 | 5 | 1 53 6.09 | 2.2033 | 14 38 13.7 | 14.909 |
| 6 | 0 14 58.63 | 2.0004 | 2 8 50.4 | 16.389 | 6 | 1 55 18.47 | 2.2094 | 14 53 6.1 | 14.837 |
| 7 | 0 16 58.73 | 2.0029 | 2 25 13.9 | 16.392 | 7 | 1 57 31.22 | 2.2155 | 15 7 54.2 | 14.764 |
| 8 | 0 18 58.98 | 2.0055 | 2 41 37.5 | 16.394 | 8 | 1 59 44.33 | 2.2216 | 15 22 37.8 | 14.689 |
| 9 | 0 20 59.39 | 2.0082 | 2 58 1.2 | 16.395 | 9 | 2 1 57.81 | 2.2278 | 15 37 16.9 | 14.612 |
| 10 | 0 22 59.96 | 2.0109 | 3 14 24.9 | 16.395 | 10 | 2 4 11.67 | 2.2341 | 15 51 51.3 | 14.533 |
| 11 | 0 25 0.70 | 2.0138 | 3 30 48.6 | 16.393 | 11 | 2 6 25.91 | 2.2405 | 16 6 20.9 | 14.452 |
| 12 | 0 27 1.62 | 2.0168 | 3 47 12.1 | 16.390 | 12 | 2 8 40.53 | 2.2469 | 16 20 45.6 | 14.370 |
| 13 | 0 29 2.72 | 2.0197 | 4 3 35.4 | 16.386 | 13 | 2 10 55.54 | 2.2533 | 16 35 5.3 | 14.286 |
| 14 | 0 31 3.99 | 2.0227 | 4 19 58.4 | 16.379 | 14 | 2 13 10.93 | 2.2597 | 16 49 19.9 | 14.199 |
| 15 | 0 33 5.44 | 2.0258 | 4 36 20.9 | 16.372 | 15 | 2 15 26.71 | 2.2662 | 17 3 29.2 | 14.111 |
| 16 | 0 35 7.09 | 2.0291 | 4 52 43.0 | 16.363 | 16 | 2 17 42.88 | 2.2728 | 17 17 33.2 | 14.021 |
| 17 | 0 37 8.94 | 2.0324 | 5 9 4.5 | 16.352 | 17 | 2 19 59.45 | 2.2795 | 17 31 31.7 | 13.929 |
| 18 | 0 39 10.98 | 2.0358 | 5 25 25.2 | 16.339 | 18 | 2 22 16.42 | 2.2862 | 17 45 24.7 | 13.836 |
| 19 | 0 41 13.23 | 2.0393 | 5 41 45.1 | 16.326 | 19 | 2 24 33.79 | 2.2929 | 17 59 12.0 | 13.740 |
| 20 | 0 43 15.70 | 2.0429 | 5 58 4.3 | 16.312 | 20 | 2 26 51.57 | 2.2997 | 18 12 53.5 | 13.642 |
| 21 | 0 45 18.38 | 2.0465 | 6 14 22.6 | 16.296 | 21 | 2 29 9.75 | 2.3064 | 18 26 29.1 | 13.543 |
| 22 | 0 47 21.28 | 2.0502 | 6 30 39.8 | 16.277 | 22 | 2 31 28.34 | 2.3132 | 18 39 58.7 | 13.442 |
| 23 | 0 49 24.41 | 2.0540 | N. 6 46 55.9 | 16.257 | 23 | 2 33 47.34 | 2.3200 | N.18 53 22.1 | 13.338 |
| **SUNDAY 26.** | | | | | **TUESDAY 28.** | | | | |
| 0 | 0 51 27.76 | 2.0578 | N. 7 3 10.7 | 16.236 | 0 | 2 36 6.74 | 2.3268 | N.19 6 39.3 | 13.234 |
| 1 | 0 53 31.35 | 2.0618 | 7 19 24.2 | 16.213 | 1 | 2 38 26.56 | 2.3338 | 19 19 50.2 | 13.127 |
| 2 | 0 55 35.18 | 2.0659 | 7 35 36.3 | 16.190 | 2 | 2 40 46.80 | 2.3407 | 19 32 54.6 | 13.018 |
| 3 | 0 57 39.26 | 2.0701 | 7 51 47.0 | 16.165 | 3 | 2 43 7.45 | 2.3477 | 19 45 52.4 | 12.907 |
| 4 | 0 59 43.59 | 2.0742 | 8 7 56.1 | 16.137 | 4 | 2 45 28.52 | 2.3547 | 19 58 43.5 | 12.795 |
| 5 | 1 1 48.17 | 2.0784 | 8 24 3.4 | 16.106 | 5 | 2 47 50.01 | 2.3616 | 20 11 27.8 | 12.682 |
| 6 | 1 3 53.00 | 2.0827 | 8 40 8.8 | 16.075 | 6 | 2 50 11.91 | 2.3685 | 20 24 5.3 | 12.567 |
| 7 | 1 5 58.10 | 2.0872 | 8 56 12.4 | 16.044 | 7 | 2 52 34.23 | 2.3756 | 20 36 35.8 | 12.448 |
| 8 | 1 8 3.47 | 2.0918 | 9 12 14.1 | 16.011 | 8 | 2 54 56.98 | 2.3827 | 20 48 59.1 | 12.327 |
| 9 | 1 10 9.12 | 2.0964 | 9 28 13.7 | 15.975 | 9 | 2 57 20.15 | 2.3897 | 21 1 15.0 | 12.204 |
| 10 | 1 12 15.04 | 2.1010 | 9 44 11.1 | 15.937 | 10 | 2 59 43.74 | 2.3967 | 21 13 23.6 | 12.082 |
| 11 | 1 14 21.24 | 2.1057 | 10 0 6.2 | 15.899 | 11 | 3 2 7.75 | 2.4038 | 21 25 24.8 | 11.958 |
| 12 | 1 16 27.73 | 2.1106 | 10 15 59.0 | 15.859 | 12 | 3 4 32.19 | 2.4108 | 21 37 18.5 | 11.831 |
| 13 | 1 18 34.51 | 2.1155 | 10 31 49.3 | 15.817 | 13 | 3 6 57.05 | 2.4178 | 21 49 4.5 | 11.701 |
| 14 | 1 20 41.59 | 2.1204 | 10 47 37.0 | 15.773 | 14 | 3 9 22.32 | 2.4248 | 22 0 42.6 | 11.569 |
| 15 | 1 22 48.96 | 2.1254 | 11 3 22.0 | 15.727 | 15 | 3 11 48.02 | 2.4318 | 22 12 12.8 | 11.437 |
| 16 | 1 24 56.64 | 2.1306 | 11 19 4.2 | 15.680 | 16 | 3 14 14.14 | 2.4387 | 22 23 35.0 | 11.302 |
| 17 | 1 27 4.63 | 2.1358 | 11 34 43.6 | 15.632 | 17 | 3 16 40.67 | 2.4457 | 22 34 49.1 | 11.166 |
| 18 | 1 29 12.93 | 2.1410 | 11 50 20.0 | 15.581 | 18 | 3 19 7.62 | 2.4527 | 22 45 54.9 | 11.027 |
| 19 | 1 31 21.55 | 2.1463 | 12 5 53.3 | 15.528 | 19 | 3 21 34.99 | 2.4596 | 22 56 52.4 | 10.888 |
| 20 | 1 33 30.49 | 2.1517 | 12 21 23.4 | 15.474 | 20 | 3 24 2.77 | 2.4664 | 23 7 41.5 | 10.747 |
| 21 | 1 35 39.75 | 2.1571 | 12 36 50.2 | 15.418 | 21 | 3 26 30.96 | 2.4733 | 23 18 22.0 | 10.603 |
| 22 | 1 37 49.34 | 2.1627 | 12 52 13.6 | 15.361 | 22 | 3 28 59.57 | 2.4801 | 23 28 53.8 | 10.458 |
| 23 | 1 39 59.27 | 2.1683 | 13 7 33.5 | 15.302 | 23 | 3 31 28.58 | 2.4869 | 23 39 16.9 | 10.311 |
| 24 | 1 42 9.54 | 2.1740 | N.13 22 49.9 | 15.242 | 24 | 3 33 58.00 | 2.4937 | N.23 49 31.1 | 10.162 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### WEDNESDAY 29.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 3 33 58.00 | 2.4937 | N.23 49 31.1 | 10.162 |
| 1 | 3 36 27.82 | 2.5004 | 23 59 36.3 | 10.011 |
| 2 | 3 38 58.04 | 2.5071 | 24 9 32.4 | 9.859 |
| 3 | 3 41 28.67 | 2.5138 | 24 19 19.4 | 9.706 |
| 4 | 3 43 59.69 | 2.5203 | 24 28 57.1 | 9.550 |
| 5 | 3 46 31.10 | 2.5267 | 24 38 25.4 | 9.393 |
| 6 | 3 49 2.89 | 2.5330 | 24 47 44.3 | 9.235 |
| 7 | 3 51 35.06 | 2.5394 | 24 56 53.6 | 9.074 |
| 8 | 3 54 7.62 | 2.5458 | 25 5 53.2 | 8.912 |
| 9 | 3 56 40.56 | 2.5521 | 25 14 43.0 | 8.748 |
| 10 | 3 59 13.87 | 2.5582 | 25 23 23.0 | 8.583 |
| 11 | 4 1 47.54 | 2.5642 | 25 31 53.0 | 8.417 |
| 12 | 4 4 21.57 | 2.5702 | 25 40 13.0 | 8.249 |
| 13 | 4 6 55.96 | 2.5760 | 25 48 22.9 | 8.079 |
| 14 | 4 9 30.69 | 2.5818 | 25 56 22.5 | 7.907 |
| 15 | 4 12 5.77 | 2.5875 | 26 4 11.8 | 7.735 |
| 16 | 4 14 41.19 | 2.5931 | 26 11 50.7 | 7.562 |
| 17 | 4 17 16.94 | 2.5986 | 26 19 19.2 | 7.387 |
| 18 | 4 19 53.02 | 2.6040 | 26 26 37.1 | 7.210 |
| 19 | 4 22 29.42 | 2.6092 | 26 33 44.4 | 7.032 |
| 20 | 4 25 6.13 | 2.6143 | 26 40 41.0 | 6.852 |
| 21 | 4 27 43.14 | 2.6193 | 26 47 26.7 | 6.671 |
| 22 | 4 30 20.45 | 2.6243 | 26 54 1.5 | 6.489 |
| 23 | 4 32 58.06 | 2.6292 | N.27 0 25.4 | 6.307 |

### THURSDAY 30.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 4 35 35.95 | 2.6339 | N.27 6 38.4 | 6.124 |
| 1 | 4 38 14.12 | 2.6384 | 27 12 40.3 | 5.938 |
| 2 | 4 40 52.56 | 2.6427 | 27 18 31.0 | 5.751 |
| 3 | 4 43 31.25 | 2.6469 | 27 24 10.4 | 5.563 |
| 4 | 4 46 10.19 | 2.6511 | 27 29 38.6 | 5.376 |
| 5 | 4 48 49.38 | 2.6551 | 27 34 55.5 | 5.187 |
| 6 | 4 51 28.80 | 2.6589 | 27 40 1.0 | 4.996 |
| 7 | 4 54 8.45 | 2.6626 | 27 44 55.0 | 4.804 |
| 8 | 4 56 48.31 | 2.6661 | 27 49 37.5 | 4.612 |
| 9 | 4 59 28.38 | 2.6695 | 27 54 8.5 | 4.420 |
| 10 | 5 2 8.65 | 2.6727 | 27 58 27.9 | 4.226 |
| 11 | 5 4 49.10 | 2.6758 | 28 2 35.6 | 4.030 |
| 12 | 5 7 29.74 | 2.6787 | 28 6 31.5 | 3.834 |
| 13 | 5 10 10.55 | 2.6814 | 28 10 15.7 | 3.638 |
| 14 | 5 12 51.51 | 2.6838 | 28 13 48.1 | 3.442 |
| 15 | 5 15 32.61 | 2.6862 | 28 17 8.8 | 3.246 |
| 16 | 5 18 13.85 | 2.6885 | 28 20 17.6 | 3.047 |
| 17 | 5 20 55.23 | 2.6906 | 28 23 14.4 | 2.848 |
| 18 | 5 23 36.73 | 2.6925 | 28 25 59.3 | 2.649 |
| 19 | 5 26 18.33 | 2.6942 | 28 28 32.3 | 2.450 |
| 20 | 5 29 0.03 | 2.6957 | 28 30 53.3 | 2.250 |
| 21 | 5 31 41.81 | 2.6969 | 28 33 2.3 | 2.050 |
| 22 | 5 34 23.66 | 2.6981 | 28 34 59.3 | 1.850 |
| 23 | 5 37 5.58 | 2.6992 | 28 36 44.3 | 1.649 |
| 24 | 5 39 47.56 | 2.7000 | N.28 38 17.2 | 1.448 |

### FRIDAY 31.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 5 39 47.56 | 2.7000 | N.28 38 17.2 | 1.448 |
| 1 | 5 42 29.58 | 2.7006 | 28 39 38.1 | 1.247 |
| 2 | 5 45 11.63 | 2.7009 | 28 40 46.9 | 1.046 |
| 3 | 5 47 53.69 | 2.7011 | 28 41 43.6 | 0.844 |
| 4 | 5 50 35.76 | 2.7012 | 28 42 28.2 | 0.643 |
| 5 | 5 53 17.84 | 2.7012 | 28 43 0.7 | 0.442 |
| 6 | 5 55 59.91 | 2.7009 | 28 43 21.2 | 0.241 |
| 7 | 5 58 41.95 | 2.7004 | 28 43 29.6 | +0.039 |
| 8 | 6 1 23.95 | 2.6997 | 28 43 25.9 | −0.162 |
| 9 | 6 4 5.91 | 2.6988 | 28 43 10.1 | 0.363 |
| 10 | 6 6 47.81 | 2.6978 | 28 42 42.3 | 0.563 |
| 11 | 6 9 29.64 | 2.6966 | 28 42 2.5 | 0.764 |
| 12 | 6 12 11.40 | 2.6952 | 28 41 10.6 | 0.965 |
| 13 | 6 14 53.07 | 2.6936 | 28 40 6.7 | 1.164 |
| 14 | 6 17 34.63 | 2.6918 | 28 38 50.9 | 1.363 |
| 15 | 6 20 16.08 | 2.6898 | 28 37 23.2 | 1.562 |
| 16 | 6 22 57.41 | 2.6877 | 28 35 43.5 | 1.761 |
| 17 | 6 25 38.61 | 2.6855 | 28 33 51.9 | 1.959 |
| 18 | 6 28 19.67 | 2.6831 | 28 31 48.4 | 2.157 |
| 19 | 6 31 0.58 | 2.6804 | 28 29 33.1 | 2.353 |
| 20 | 6 33 41.32 | 2.6776 | 28 27 6.0 | 2.549 |
| 21 | 6 36 21.89 | 2.6747 | 28 24 27.2 | 2.744 |
| 22 | 6 39 2.28 | 2.6715 | 28 21 36.7 | 2.939 |
| 23 | 6 41 42.47 | 2.6682 | N.28 18 34.5 | 3.133 |

### SATURDAY, APRIL 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 6 44 22.46 | 2.6648 | N.28 15 20.7 | 3.327 |

### PHASES OF THE MOON.

| | | d | h | m |
|---|---|---|---|---|
| ☽ | First Quarter,. . . | 2 | 21 | 47.8 |
| ○ | Full Moon,. . . | 9 | 18 | 12.3 |
| ☾ | Last Quarter, . . | 17 | 13 | 24.5 |
| ● | New Moon, . . | 25 | 8 | 11.7 |

| | | d | h |
|---|---|---|---|
| ☾ | Perigee,. . . . . | 5 | 1.7 |
| ☾ | Apogee,. . . . . | 17 | 12.5 |
| ☾ | Perigee,. . . . . | 29 | 22.0 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L of Diff. | IIIh. | P. L. of Diff. | VIh. | P.L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | |
| 1 | Sun | W. | 65 9 10 | 2691 | 66 46 2 | 2686 | 68 23 1 | 2681 | 70 0 7 | 2675 |
| | Venus | W. | 27 59 45 | 2763 | 29 35 1 | 2757 | 31 10 25 | 2751 | 32 45 57 | 2745 |
| | Mars | W. | 14 58 38 | 2644 | 16 36 33 | 2629 | 18 14 48 | 2617 | 19 53 20 | 2605 |
| | Pollux | E. | 64 52 7 | 2368 | 63 7 46 | 2363 | 61 23 18 | 2358 | 59 38 43 | 2354 |
| | Regulus | E. | 101 40 3 | 2368 | 99 55 43 | 2364 | 98 11 16 | 2359 | 96 26 42 | 2355 |
| 2 | Sun | W. | 78 7 21 | 2651 | 79 45 7 | 2646 | 81 23 0 | 2642 | 83 0 58 | 2637 |
| | Venus | W. | 40 45 27 | 2719 | 42 21 41 | 2714 | 43 58 2 | 2710 | 45 34 29 | 2704 |
| | Mars | W. | 28 9 10 | 2568 | 29 48 49 | 2561 | 31 28 37 | 2556 | 33 8 32 | 2551 |
| | α Arietis | W. | 24 49 30 | 2497 | 26 30 48 | 2473 | 28 12 39 | 2453 | 29 54 59 | 2436 |
| | Pollux | E. | 50 54 13 | 2332 | 49 9 0 | 2328 | 47 23 42 | 2324 | 45 38 18 | 2320 |
| | Regulus | E. | 87 42 14 | 2332 | 85 57 1 | 2328 | 84 11 42 | 2324 | 82 26 17 | 2320 |
| 3 | Sun | W. | 91 12 18 | 2617 | 92 50 50 | 2613 | 94 29 27 | 2610 | 96 8 9 | 2607 |
| | Venus | W. | 53 38 14 | 2664 | 55 15 15 | 2680 | 56 52 22 | 2676 | 58 29 34 | 2672 |
| | Mars | W. | 41 29 55 | 2527 | 43 10 31 | 2523 | 44 51 12 | 2520 | 46 31 58 | 2515 |
| | α Arietis | W. | 38 31 54 | 2375 | 40 16 5 | 2366 | 42 0 29 | 2357 | 43 45 5 | 2350 |
| | Pollux | E. | 36 50 0 | 2304 | 35 4 6 | 2302 | 33 18 9 | 2299 | 31 32 8 | 2296 |
| | Regulus | E. | 73 37 48 | 2302 | 71 51 51 | 2298 | 70 5 49 | 2295 | 68 19 42 | 2292 |
| 4 | Sun | W. | 104 22 44 | 2591 | 106 1 51 | 2589 | 107 41 1 | 2586 | 109 20 15 | 2585 |
| | Venus | W. | 66 36 42 | 2657 | 68 14 20 | 2655 | 69 52 1 | 2652 | 71 29 45 | 2650 |
| | Mars | W. | 54 57 4 | 2499 | 56 38 18 | 2497 | 58 19 36 | 2494 | 60 0 57 | 2492 |
| | α Arietis | W. | 52 30 25 | 2322 | 54 15 52 | 2317 | 56 1 26 | 2313 | 57 47 6 | 2310 |
| | Aldebaran | W. | 23 16 35 | 2746 | 24 52 14 | 2685 | 26 29 14 | 2635 | 28 7 22 | 2593 |
| | Regulus | E. | 59 28 6 | 2279 | 57 41 36 | 2277 | 55 55 2 | 2275 | 54 8 26 | 2273 |
| | Spica | E. | 113 27 42 | 2274 | 111 41 5 | 2272 | 109 54 25 | 2270 | 108 7 42 | 2268 |
| 5 | Sun | W. | 117 37 0 | 2577 | 119 16 26 | 2576 | 120 55 54 | 2575 | 122 35 23 | 2575 |
| | Venus | W. | 79 39 5 | 2643 | 81 17 2 | 2641 | 82 55 1 | 2640 | 84 33 1 | 2640 |
| | Mars | W. | 68 28 23 | 2485 | 70 9 58 | 2484 | 71 51 34 | 2483 | 73 33 11 | 2482 |
| | α Arietis | W. | 66 36 33 | 2297 | 68 22 37 | 2296 | 70 8 43 | 2294 | 71 54 51 | 2294 |
| | Aldebaran | W. | 36 29 46 | 2462 | 38 11 53 | 2446 | 39 54 22 | 2432 | 41 37 11 | 2420 |
| | Regulus | E. | 45 14 53 | 2268 | 43 28 7 | 2268 | 41 41 20 | 2268 | 39 54 33 | 2268 |
| | Spica | E. | 99 13 28 | 2262 | 97 26 32 | 2260 | 95 39 34 | 2260 | 93 52 36 | 2260 |
| 6 | Sun | W. | 130 52 45 | 2578 | 132 32 10 | 2580 | 134 11 33 | 2581 | 135 50 54 | 2584 |
| | Venus | W. | 92 42 58 | 2643 | 94 20 55 | 2645 | 95 58 49 | 2646 | 97 36 41 | 2649 |
| | Mars | W. | 82 1 17 | 2485 | 83 42 51 | 2487 | 85 24 23 | 2488 | 87 5 53 | 2491 |
| | α Arietis | W. | 80 45 42 | 2294 | 82 31 51 | 2295 | 84 17 58 | 2296 | 86 4 3 | 2298 |
| | Aldebaran | W. | 50 14 46 | 2382 | 51 58 46 | 2378 | 53 42 53 | 2375 | 55 27 4 | 2372 |
| | Spica | E. | 84 57 47 | 2262 | 83 10 52 | 2264 | 81 24 0 | 2266 | 79 37 10 | 2268 |
| | Jupiter | E. | 124 13 2 | 2304 | 122 27 8 | 2304 | 120 41 15 | 2304 | 118 55 22 | 2306 |
| 7 | Venus | W. | 105 45 7 | 2665 | 107 22 34 | 2669 | 108 59 55 | 2674 | 110 37 10 | 2679 |
| | Mars | W. | 95 32 25 | 2507 | 97 13 29 | 2511 | 98 54 27 | 2515 | 100 35 19 | 2520 |
| | α Arietis | W. | 94 53 35 | 2313 | 96 39 15 | 2317 | 98 24 49 | 2322 | 100 10 16 | 2328 |
| | Aldebaran | W. | 64 8 34 | 2371 | 65 52 51 | 2372 | 67 37 6 | 2374 | 69 21 18 | 2377 |
| | Pollux | W. | 20 11 20 | 2300 | 21 57 20 | 2301 | 23 43 18 | 2304 | 25 29 12 | 2307 |
| | Spica | E. | 70 43 54 | 2283 | 68 57 29 | 2287 | 67 11 10 | 2291 | 65 24 57 | 2296 |
| | Jupiter | E. | 110 6 32 | 2317 | 108 20 57 | 2320 | 106 35 27 | 2324 | 104 50 2 | 2328 |
| | Antares | E. | 116 37 51 | 2283 | 114 51 26 | 2287 | 113 5 7 | 2291 | 111 18 55 | 2296 |
| 8 | Aldebaran | W. | 78 1 2 | 2399 | 79 44 38 | 2405 | 81 28 5 | 2412 | 83 11 23 | 2419 |
| | Pollux | W. | 34 17 18 | 2331 | 36 2 32 | 2337 | 37 47 37 | 2344 | 39 32 32 | 2351 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun | W. | 71° 37′ 21″ | 2670 | 73° 14′ 41″ | 2665 | 74° 52′ 8″ | 2660 | 76° 29′ 41″ | 2655 |
| | Venus | W. | 34 21 37 | 2740 | 35 57 24 | 2735 | 37 33 18 | 2729 | 39 9 19 | 2724 |
| | Mars | W. | 21 32 8 | 2596 | 23 11 8 | 2588 | 24 50 19 | 2581 | 26 29 40 | 2574 |
| | Pollux | E. | 57 54 2 | 2349 | 56 9 14 | 2345 | 54 24 20 | 2341 | 52 39 20 | 2336 |
| | Regulus | E. | 94 42 2 | 2350 | 92 57 15 | 2345 | 91 12 21 | 2341 | 89 27 21 | 2336 |
| 2 | Sun | W. | 84 39 3 | 2632 | 86 17 14 | 2629 | 87 55 30 | 2625 | 89 33 51 | 2621 |
| | Venus | W. | 47 11 3 | 2701 | 48 47 42 | 2696 | 50 24 27 | 2692 | 52 1 18 | 2688 |
| | Mars | W. | 34 48 35 | 2545 | 36 28 45 | 2540 | 38 9 2 | 2536 | 39 49 25 | 2531 |
| | α Arietis | W. | 31 37 43 | 2420 | 33 20 49 | 2407 | 35 4 14 | 2395 | 36 47 56 | 2384 |
| | Pollux | E. | 43 52 48 | 2317 | 42 7 13 | 2314 | 40 21 34 | 2310 | 38 35 49 | 2307 |
| | Regulus | E. | 80 40 46 | 2316 | 78 55 10 | 2312 | 77 9 28 | 2309 | 75 23 41 | 2304 |
| 3 | Sun | W. | 97 46 55 | 2603 | 99 25 46 | 2600 | 101 4 41 | 2596 | 102 43 41 | 2594 |
| | Venus | W. | 60 6 51 | 2669 | 61 44 12 | 2666 | 63 21 38 | 2663 | 64 59 8 | 2660 |
| | Mars | W. | 48 12 50 | 2512 | 49 53 47 | 2509 | 51 34 48 | 2505 | 53 15 54 | 2502 |
| | α Arietis | W. | 45 29 51 | 2344 | 47 14 46 | 2337 | 48 59 51 | 2332 | 50 45 4 | 2326 |
| | Pollux | E. | 29 46 3 | 2294 | 27 59 55 | 2293 | 26 13 45 | 2291 | 24 27 33 | 2290 |
| | Regulus | E. | 66 33 31 | 2289 | 64 47 16 | 2286 | 63 0 56 | 2284 | 61 14 33 | 2281 |
| 4 | Sun | W. | 110 59 31 | 2583 | 112 38 50 | 2581 | 114 18 11 | 2579 | 115 57 35 | 2578 |
| | Venus | W. | 73 7 32 | 2648 | 74 45 22 | 2646 | 76 23 14 | 2644 | 78 1 9 | 2643 |
| | Mars | W. | 61 42 21 | 2490 | 63 23 48 | 2488 | 65 5 18 | 2487 | 66 46 50 | 2486 |
| | α Arietis | W. | 59 32 51 | 2307 | 61 18 40 | 2304 | 63 4 34 | 2301 | 64 50 32 | 2299 |
| | Aldebaran | W. | 29 46 27 | 2558 | 31 26 20 | 2527 | 33 6 55 | 2502 | 34 48 5 | 2480 |
| | Regulus | E. | 52 21 47 | 2272 | 50 35 6 | 2270 | 48 48 23 | 2270 | 47 1 39 | 2268 |
| | Spica | E. | 106 20 56 | 2266 | 104 34 7 | 2265 | 102 47 16 | 2264 | 101 0 23 | 2262 |
| 5 | Sun | W. | 124 14 52 | 2575 | 125 54 21 | 2575 | 127 33 50 | 2576 | 129 13 18 | 2577 |
| | Venus | W. | 86 11 1 | 2640 | 87 49 1 | 2640 | 89 27 1 | 2641 | 91 5 0 | 2642 |
| | Mars | W. | 75 14 49 | 2482 | 76 56 27 | 2483 | 78 38 4 | 2483 | 80 19 41 | 2484 |
| | α Arietis | W. | 73 41 0 | 2293 | 75 27 10 | 2292 | 77 13 21 | 2292 | 78 59 32 | 2293 |
| | Aldebaran | W. | 43 20 17 | 2410 | 45 3 37 | 2401 | 46 47 10 | 2394 | 48 30 53 | 2367 |
| | Regulus | E. | 38 7 47 | 2269 | 36 21 2 | 2270 | 34 34 18 | 2272 | 32 47 37 | 2273 |
| | Spica | E. | 92 5 37 | 2260 | 90 18 38 | 2260 | 88 31 40 | 2261 | 86 44 43 | 2262 |
| 6 | Sun | W. | 137 30 11 | 2586 | 139 9 25 | 2589 | 140 48 35 | 2592 | 142 27 41 | 2596 |
| | Venus | W. | 99 14 30 | 2652 | 100 52 15 | 2654 | 102 29 57 | 2657 | 104 7 34 | 2660 |
| | Mars | W. | 88 47 19 | 2493 | 90 28 42 | 2496 | 92 10 1 | 2499 | 93 51 16 | 2503 |
| | α Arietis | W. | 87 50 5 | 2300 | 89 36 4 | 2303 | 91 21 59 | 2306 | 93 7 50 | 2310 |
| | Aldebaran | W. | 57 11 19 | 2370 | 58 55 37 | 2369 | 60 39 56 | 2369 | 62 24 15 | 2369 |
| | Spica | E. | 77 50 23 | 2270 | 76 3 40 | 2272 | 74 17 0 | 2276 | 72 30 25 | 2279 |
| | Jupiter | E. | 117 9 31 | 2307 | 115 23 42 | 2309 | 113 37 55 | 2311 | 111 52 12 | 2313 |
| 7 | Venus | W. | 112 14 18 | 2684 | 113 51 19 | 2691 | 115 28 11 | 2697 | 117 4 55 | 2704 |
| | Mars | W. | 102 16 4 | 2525 | 103 56 42 | 2532 | 105 37 11 | 2538 | 107 17 32 | 2545 |
| | α Arietis | W. | 101 55 35 | 2333 | 103 40 47 | 2339 | 105 25 50 | 2345 | 107 10 44 | 2352 |
| | Aldebaran | W. | 71 5 26 | 2380 | 72 49 29 | 2384 | 74 33 27 | 2389 | 76 17 18 | 2394 |
| | Pollux | W. | 27 15 2 | 2311 | 29 0 46 | 2315 | 30 46 24 | 2320 | 32 31 55 | 2325 |
| | Spica | E. | 63 38 51 | 2300 | 61 52 52 | 2307 | 60 7 2 | 2312 | 58 21 20 | 2318 |
| | Jupiter | E. | 103 4 44 | 2333 | 101 19 32 | 2338 | 99 34 28 | 2343 | 97 49 31 | 2349 |
| | Antares | E. | 109 32 49 | 2301 | 107 46 51 | 2306 | 106 1 0 | 2312 | 104 15 18 | 2318 |
| 8 | Aldebaran | W. | 84 54 31 | 2426 | 86 37 28 | 2434 | 88 20 14 | 2443 | 90 2 47 | 2452 |
| | Pollux | W. | 41 17 17 | 2359 | 43 1 51 | 2367 | 44 46 13 | 2375 | 46 30 23 | 2384 |

## GREENWICH MEAN TIME.

### LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Spica | E. | 56° 35′ 47″ | 2325 | 54° 50′ 24″ | 2331 | 53° 5′ 10″ | 2339 | 51° 20′ 7″ | 2346 |
| | Jupiter | E. | 96 4 43 | 2355 | 94 20 4 | 2362 | 92 35 35 | 2369 | 90 51 16 | 2376 |
| | Antares | E. | 102 29 45 | 2324 | 100 44 21 | 2332 | 98 59 8 | 2339 | 97 14 5 | 2346 |
| 9 | Aldebaran | W. | 91 45 8 | 2462 | 93 27 15 | 2471 | 95 9 9 | 2482 | 96 50 48 | 2492 |
| | Pollux | W. | 48 14 21 | 2393 | 49 58 6 | 2403 | 51 41 37 | 2412 | 53 24 54 | 2423 |
| | Spica | E. | 42 37 45 | 2389 | 40 53 55 | 2399 | 39 10 19 | 2409 | 37 26 57 | 2419 |
| | Jupiter | E. | 82 12 32 | 2420 | 80 29 26 | 2429 | 78 46 33 | 2440 | 77 3 55 | 2450 |
| | Antares | E. | 88 31 45 | 2390 | 86 47 56 | 2399 | 85 4 20 | 2409 | 83 20 58 | 2419 |
| 10 | Aldebaran | W. | 105 15 4 | 2553 | 106 55 3 | 2566 | 108 34 44 | 2580 | 110 14 6 | 2594 |
| | Pollux | W. | 61 57 33 | 2478 | 63 39 17 | 2489 | 65 20 45 | 2502 | 67 1 56 | 2514 |
| | Regulus | W. | 25 12 53 | 2492 | 26 54 17 | 2502 | 28 35 27 | 2513 | 30 16 22 | 2525 |
| | Spica | E. | 28 53 56 | 2475 | 27 12 8 | 2487 | 25 30 37 | 2499 | 23 49 23 | 2512 |
| | Jupiter | E. | 68 34 35 | 2508 | 66 53 33 | 2520 | 65 12 48 | 2533 | 63 32 21 | 2546 |
| | Antares | E. | 74 47 57 | 2475 | 73 6 9 | 2487 | 71 24 38 | 2499 | 69 43 24 | 2512 |
| | α Aquilæ | E. | 121 6 14 | 3644 | 119 48 27 | 3617 | 118 30 11 | 3593 | 117 11 29 | 3572 |
| 11 | Pollux | W. | 75 23 27 | 2579 | 77 2 51 | 2592 | 78 41 57 | 2606 | 80 20 44 | 2620 |
| | Regulus | W. | 38 36 55 | 2585 | 40 16 11 | 2598 | 41 55 9 | 2611 | 43 33 49 | 2624 |
| | Jupiter | E. | 55 14 45 | 2616 | 53 36 12 | 2631 | 51 57 59 | 2646 | 50 20 7 | 2661 |
| | Antares | E. | 61 21 38 | 2577 | 59 42 11 | 2591 | 58 3 3 | 2604 | 56 24 13 | 2618 |
| | α Aquilæ | E. | 110 33 24 | 3511 | 109 13 12 | 3506 | 107 52 55 | 3503 | 106 32 34 | 3500 |
| 12 | Pollux | W. | 88 29 58 | 2689 | 90 6 53 | 2703 | 91 43 29 | 2717 | 93 19 46 | 2731 |
| | Regulus | W. | 51 42 37 | 2692 | 53 19 28 | 2706 | 54 56 0 | 2719 | 56 32 14 | 2733 |
| | Jupiter | E. | 42 16 2 | 2743 | 40 40 19 | 2760 | 39 4 58 | 2777 | 37 30 0 | 2795 |
| | Antares | E. | 48 14 44 | 2687 | 46 37 47 | 2701 | 45 1 8 | 2715 | 43 24 48 | 2729 |
| | α Aquilæ | E. | 99 50 55 | 3516 | 98 30 49 | 3523 | 97 10 50 | 3531 | 95 51 0 | 3540 |
| 13 | Pollux | W. | 101 16 41 | 2798 | 102 51 11 | 2811 | 104 25 24 | 2825 | 105 59 19 | 2838 |
| | Regulus | W. | 64 28 54 | 2801 | 66 3 21 | 2814 | 67 37 31 | 2827 | 69 11 24 | 2840 |
| | Jupiter | E. | 29 41 22 | 2897 | 28 8 59 | 2920 | 26 37 5 | 2945 | 25 5 43 | 2973 |
| | Antares | E. | 35 27 41 | 2796 | 33 53 8 | 2810 | 32 18 53 | 2823 | 30 44 55 | 2836 |
| | α Aquilæ | E. | 89 14 44 | 3600 | 87 56 10 | 3616 | 86 37 53 | 3632 | 85 19 53 | 3648 |
| | Sun | E. | 140 39 33 | 3153 | 139 12 28 | 3168 | 137 45 40 | 3182 | 136 19 9 | 3195 |
| 14 | Pollux | W. | 113 44 50 | 2900 | 115 17 9 | 2911 | 116 49 14 | 2923 | 118 21 4 | 2934 |
| | Regulus | W. | 76 56 46 | 2901 | 78 29 4 | 2912 | 80 1 8 | 2924 | 81 32 57 | 2934 |
| | Spica | W. | 22 54 57 | 2897 | 24 27 20 | 2909 | 25 59 28 | 2920 | 27 31 21 | 2931 |
| | Antares | E. | 22 59 14 | 2898 | 21 26 53 | 2909 | 19 54 46 | 2921 | 18 22 54 | 2931 |
| | α Aquilæ | E. | 78 54 33 | 3744 | 77 38 32 | 3765 | 76 22 53 | 3788 | 75 7 38 | 3811 |
| | Sun | E. | 129 10 36 | 3262 | 127 45 40 | 3275 | 126 20 59 | 3287 | 124 56 32 | 3298 |
| 15 | Regulus | W. | 89 8 45 | 2984 | 90 39 18 | 2993 | 92 9 40 | 3001 | 93 39 51 | 3009 |
| | Spica | W. | 35 7 30 | 2981 | 36 38 7 | 2989 | 38 8 34 | 2997 | 39 38 50 | 3006 |
| | α Aquilæ | E. | 68 57 44 | 3942 | 67 45 7 | 3973 | 66 33 1 | 4005 | 65 21 26 | 4037 |
| | Sun | E. | 117 57 33 | 3352 | 116 34 22 | 3362 | 115 11 22 | 3371 | 113 48 32 | 3379 |
| 16 | Regulus | W. | 101 8 30 | 3043 | 102 37 49 | 3048 | 104 7 2 | 3053 | 105 36 9 | 3058 |
| | Spica | W. | 47 7 49 | 3039 | 48 37 13 | 3045 | 50 6 30 | 3050 | 51 35 41 | 3055 |
| | α Aquilæ | E | 59 32 1 | 4228 | 58 24 1 | 4273 | 57 16 43 | 4319 | 56 10 8 | 4369 |
| | Sun | E. | 106 56 41 | 3416 | 105 34 43 | 3422 | 104 12 51 | 3427 | 102 51 5 | 3432 |
| 17 | Regulus | W. | 113 0 30 | 3073 | 114 29 12 | 3075 | 115 57 52 | 3077 | 117 26 30 | 3077 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Spica | E. | 49° 35′ 14″ | 2355 | 47° 50′ 34″ | 2362 | 46° 6′ 5″ | 2371 | 44° 21′ 49″ | 2380 |
| | Jupiter | E. | 89 7 7 | 2384 | 87 23 10 | 2393 | 85 39 25 | 2401 | 83 55 52 | 2410 |
| | Antares | E. | 95 29 13 | 2354 | 93 44 32 | 2363 | 92 0 4 | 2371 | 90 15 48 | 2380 |
| 9 | Aldebaran | W. | 98 32 12 | 2504 | 100 13 20 | 2515 | 101 54 12 | 2527 | 103 34 47 | 2540 |
| | Pollux | W. | 55 7 56 | 2433 | 56 50 44 | 2444 | 58 33 16 | 2455 | 60 15 33 | 2467 |
| | Spica | E. | 35 43 50 | 2430 | 34 0 58 | 2441 | 32 18 21 | 2452 | 30 36 0 | 2464 |
| | Jupiter | E. | 75 21 31 | 2461 | 73 39 23 | 2472 | 71 57 31 | 2484 | 70 15 55 | 2495 |
| | Antares | E. | 81 37 51 | 2430 | 79 54 59 | 2441 | 78 12 22 | 2452 | 76 30 1 | 2464 |
| 10 | Aldebaran | W. | 111 53 9 | 2609 | 113 31 52 | 2624 | 115 10 14 | 2639 | 116 48 16 | 2655 |
| | Pollux | W. | 68 42 50 | 2527 | 70 23 26 | 2540 | 72 3 44 | 2552 | 73 43 45 | 2566 |
| | Regulus | W. | 31 57 1 | 2535 | 33 37 25 | 2548 | 35 17 32 | 2560 | 36 57 22 | 2572 |
| | Spica | E. | 22 8 26 | 2525 | 20 27 47 | 2537 | 18 47 25 | 2550 | 17 7 21 | 2564 |
| | Jupiter | E. | 61 52 12 | 2560 | 60 12 22 | 2573 | 58 32 50 | 2588 | 56 53 38 | 2601 |
| | Antares | E. | 68 2 27 | 2525 | 66 21 48 | 2538 | 64 41 27 | 2550 | 63 1 23 | 2564 |
| | α Aquilæ | E. | 115 52 24 | 3555 | 114 33 0 | 3541 | 113 13 21 | 3528 | 111 53 28 | 3518 |
| 11 | Pollux | W. | 81 59 12 | 2633 | 83 37 22 | 2647 | 85 15 13 | 2661 | 86 52 45 | 2675 |
| | Regulus | W. | 45 12 11 | 2638 | 46 50 15 | 2651 | 48 28 1 | 2665 | 50 5 28 | 2678 |
| | Jupiter | E. | 48 42 35 | 2677 | 47 5 24 | 2693 | 45 28 35 | 2709 | 43 52 7 | 2726 |
| | Antares | E. | 54 45 42 | 2631 | 53 7 29 | 2645 | 51 29 35 | 2659 | 49 52 0 | 2673 |
| | α Aquilæ | E. | 105 12 10 | 3501 | 103 51 47 | 3503 | 102 31 26 | 3506 | 101 11 8 | 3510 |
| 12 | Pollux | W. | 94 55 45 | 2744 | 96 31 26 | 2758 | 98 6 49 | 2772 | 99 41 54 | 2785 |
| | Regulus | W. | 58 8 10 | 2747 | 59 43 48 | 2760 | 61 19 8 | 2774 | 62 54 10 | 2788 |
| | Jupiter | E. | 35 55 26 | 2814 | 34 21 16 | 2834 | 32 47 32 | 2854 | 31 14 14 | 2874 |
| | Antares | E. | 41 48 46 | 2743 | 40 13 3 | 2756 | 38 37 38 | 2770 | 37 2 31 | 2783 |
| | α Aquilæ | E. | 94 31 20 | 3550 | 93 11 51 | 3562 | 91 52 35 | 3575 | 90 33 33 | 3587 |
| 13 | Pollux | W. | 107 32 58 | 2851 | 109 6 20 | 2863 | 110 39 26 | 2876 | 112 12 16 | 2888 |
| | Regulus | W. | 70 45 0 | 2852 | 72 18 20 | 2865 | 73 51 24 | 2876 | 75 24 13 | 2889 |
| | Jupiter | E. | 23 34 56 | 3002 | 22 4 46 | 3036 | 20 35 18 | 3075 | 19 6 38 | 3122 |
| | Antares | E. | 29 11 14 | 2849 | 27 37 50 | 2862 | 26 4 42 | 2874 | 24 31 50 | 2887 |
| | α Aquilæ | E. | 84 2 10 | 3665 | 82 44 46 | 3683 | 81 27 41 | 3702 | 80 10 56 | 3723 |
| | Sun | E. | 134 52 54 | 3209 | 133 26 56 | 3223 | 132 1 14 | 3236 | 130 35 47 | 3249 |
| 14 | Pollux | W. | 119 52 40 | 2945 | 121 24 2 | 2954 | 122 55 12 | 2965 | 124 26 9 | 2974 |
| | Regulus | W. | 83 4 33 | 2945 | 84 35 55 | 2955 | 86 7 4 | 2965 | 87 38 0 | 2974 |
| | Spica | W. | 29 3 1 | 2942 | 30 34 27 | 2951 | 32 5 41 | 2962 | 33 36 42 | 2972 |
| | Antares | E. | 16 51 15 | 2942 | 15 19 50 | 2953 | 13 48 38 | 2963 | 12 17 39 | 2974 |
| | α Aquilæ | E. | 73 52 47 | 3835 | 72 38 21 | 3861 | 71 24 22 | 3887 | 70 10 49 | 3915 |
| | Sun | E. | 123 32 18 | 3310 | 122 8 18 | 3321 | 120 44 31 | 3332 | 119 20 56 | 3342 |
| 15 | Regulus | W. | 95 9 53 | 3017 | 96 39 45 | 3024 | 98 9 28 | 3030 | 99 39 3 | 3037 |
| | Spica | W. | 41 8 55 | 3014 | 42 38 51 | 3020 | 44 8 39 | 3027 | 45 38 18 | 3034 |
| | α Aquilæ | E. | 64 10 23 | 4071 | 62 59 53 | 4108 | 61 49 59 | 4145 | 60 40 41 | 4185 |
| | Sun | E. | 112 25 52 | 3388 | 111 3 22 | 3395 | 109 41 0 | 3403 | 108 18 47 | 3409 |
| 16 | Regulus | W. | 107 5 10 | 3062 | 108 34 6 | 3065 | 110 2 58 | 3069 | 111 31 46 | 3072 |
| | Spica | W. | 53 4 46 | 3058 | 54 33 47 | 3062 | 56 2 43 | 3065 | 57 31 35 | 3067 |
| | α Aquilæ | E. | 55 4 19 | 4422 | 53 59 18 | 4480 | 52 55 8 | 4540 | 51 51 51 | 4606 |
| | Sun | E. | 101 29 25 | 3437 | 100 7 50 | 3440 | 98 46 19 | 3444 | 97 24 52 | 3446 |
| 17 | Regulus | W. | 118 55 8 | 3078 | 120 23 45 | 3077 | 121 52 23 | 3076 | 123 21 2 | 3075 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Spica | W. | 59° 0′ 25″ | 3069 | 60° 29′ 12″ | 3070 | 61° 57′ 58″ | 3072 | 63° 26′ 42″ | 3072 |
| | Jupiter | W. | 20 9 53 | 3247 | 21 35 6 | 3229 | 23 0 41 | 3212 | 24 26 36 | 3197 |
| | Antares | W. | 13 6 44 | 3071 | 14 35 29 | 3073 | 16 4 12 | 3073 | 17 32 54 | 3073 |
| | α Aquilæ | E. | 50 49 31 | 4675 | 49 48 10 | 4750 | 48 47 52 | 4831 | 47 48 41 | 4917 |
| | Sun | E. | 96 3 28 | 3449 | 94 42 7 | 3450 | 93 20 47 | 3452 | 91 59 29 | 3452 |
| 18 | Spica | W. | 70 50 20 | 3069 | 72 19 8 | 3066 | 73 47 59 | 3063 | 75 16 54 | 3060 |
| | Jupiter | W. | 31 39 56 | 3145 | 33 7 11 | 3136 | 34 34 37 | 3129 | 36 2 12 | 3120 |
| | Antares | W. | 24 56 29 | 3069 | 26 25 17 | 3067 | 27 54 7 | 3064 | 29 23 1 | 3060 |
| | Sun | E. | 85 12 55 | 3447 | 83 51 32 | 3445 | 82 30 6 | 3441 | 81 8 36 | 3438 |
| 19 | Spica | W. | 82 42 42 | 3036 | 84 12 10 | 3030 | 85 41 46 | 3023 | 87 11 30 | 3016 |
| | Jupiter | W. | 43 22 35 | 3079 | 44 51 10 | 3071 | 46 19 55 | 3062 | 47 48 51 | 3052 |
| | Antares | W. | 36 48 46 | 3036 | 38 18 14 | 3030 | 39 47 50 | 3023 | 41 17 34 | 3016 |
| | Sun | E. | 74 19 53 | 3411 | 72 57 49 | 3405 | 71 35 38 | 3397 | 70 13 18 | 3390 |
| 20 | Spica | W. | 94 42 33 | 2974 | 96 13 18 | 2965 | 97 44 14 | 2955 | 99 15 23 | 2945 |
| | Jupiter | W. | 55 16 28 | 3003 | 56 46 37 | 2993 | 58 16 59 | 2982 | 59 47 34 | 2970 |
| | Antares | W. | 48 48 36 | 2974 | 50 19 21 | 2965 | 51 50 17 | 2955 | 53 21 26 | 2946 |
| | Sun | E. | 63 19 19 | 3345 | 61 55 59 | 3334 | 60 32 27 | 3324 | 59 8 43 | 3313 |
| 21 | Spica | W. | 106 54 30 | 2889 | 108 27 3 | 2877 | 109 59 51 | 2865 | 111 32 55 | 2852 |
| | Jupiter | W. | 67 24 10 | 2911 | 68 56 15 | 2898 | 70 28 37 | 2885 | 72 1 15 | 2872 |
| | Antares | W. | 61 0 31 | 2890 | 62 33 3 | 2877 | 64 5 51 | 2865 | 65 38 55 | 2852 |
| | Sun | E. | 52 6 39 | 3252 | 50 41 31 | 3238 | 49 16 7 | 3225 | 47 50 28 | 3212 |
| 22 | Jupiter | W. | 79 48 43 | 2805 | 81 23 5 | 2790 | 82 57 46 | 2776 | 84 32 45 | 2763 |
| | Antares | W. | 73 28 22 | 2787 | 75 3 7 | 2773 | 76 38 10 | 2760 | 78 13 31 | 2745 |
| | α Aquilæ | W. | 38 34 55 | 6105 | 39 19 3 | 5856 | 40 5 47 | 5630 | 40 55 1 | 5426 |
| | Sun | E. | 40 38 4 | 3140 | 39 10 43 | 3126 | 37 43 5 | 3110 | 36 15 8 | 3096 |
| 23 | Antares | W. | 86 14 54 | 2675 | 87 52 7 | 2661 | 89 29 39 | 2647 | 91 7 30 | 2633 |
| | α Aquilæ | W. | 45 34 26 | 4645 | 46 36 12 | 4524 | 47 39 43 | 4414 | 48 44 52 | 4310 |
| 27 | Sun | W. | 21 29 24 | 2629 | 23 7 39 | 2623 | 24 46 3 | 2616 | 26 24 36 | 2610 |
| | Regulus | E. | 119 32 25 | 2317 | 117 46 51 | 2311 | 116 1 8 | 2305 | 114 15 16 | 2300 |
| 28 | Sun | W. | 34 39 18 | 2585 | 36 18 33 | 2581 | 37 57 54 | 2578 | 39 37 19 | 2575 |
| | Pollux | E. | 68 36 1 | 2276 | 66 49 26 | 2272 | 65 2 45 | 2269 | 63 16 0 | 2266 |
| | Regulus | E. | 105 24 2 | 2277 | 103 37 28 | 2273 | 101 50 49 | 2270 | 100 4 5 | 2267 |
| 29 | Sun | W. | 47 55 16 | 2566 | 49 34 58 | 2564 | 51 14 42 | 2564 | 52 54 27 | 2564 |
| | Pollux | E. | 54 21 27 | 2258 | 52 34 26 | 2258 | 50 47 24 | 2258 | 49 0 22 | 2257 |
| | Regulus | E. | 91 9 35 | 2258 | 89 22 34 | 2258 | 87 35 32 | 2257 | 85 48 29 | 2257 |
| 30 | Sun | W. | 61 13 9 | 2566 | 62 52 50 | 2567 | 64 32 30 | 2569 | 66 12 8 | 2571 |
| | Venus | W. | 18 59 40 | 2650 | 20 37 27 | 2646 | 22 15 19 | 2644 | 23 53 14 | 2643 |
| | Pollux | E. | 40 5 16 | 2262 | 38 18 20 | 2263 | 36 31 26 | 2265 | 34 44 35 | 2267 |
| | Regulus | E. | 76 53 17 | 2259 | 75 6 17 | 2261 | 73 19 20 | 2262 | 71 32 25 | 2264 |
| | Spica | E. | 130 53 59 | 2256 | 129 6 55 | 2257 | 127 19 52 | 2258 | 125 32 51 | 2260 |
| 31 | Sun | W. | 74 29 32 | 2583 | 76 8 51 | 2586 | 77 48 5 | 2589 | 79 27 15 | 2593 |
| | Venus | W. | 32 2 59 | 2645 | 33 40 53 | 2646 | 35 18 45 | 2649 | 36 56 33 | 2652 |
| | Regulus | E. | 62 38 35 | 2276 | 60 52 0 | 2279 | 59 5 29 | 2282 | 57 19 3 | 2285 |
| | Spica | E. | 116 38 32 | 2271 | 114 51 50 | 2274 | 113 5 13 | 2277 | 111 18 40 | 2281 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Spica | W. | 64° 55′ 26″ | 3073 | 66° 24′ 9″ | 3074 | 67° 52′ 51″ | 3073 | 69° 21′ 34″ | 3070 |
| | Jupiter | W. | 25 52 49 | 3184 | 27 19 17 | 3173 | 28 45 58 | 3163 | 30 12 51 | 3153 |
| | Antares | W. | 19 1 36 | 3073 | 20 30 18 | 3073 | 21 59 0 | 3072 | 23 27 44 | 3071 |
| | α Aquilæ | E. | 46 50 40 | 5012 | 45 53 54 | 5115 | 44 58 28 | 5226 | 44 4 26 | 5348 |
| | Sun | E. | 90 38 11 | 3452 | 89 16 53 | 3452 | 87 55 35 | 3451 | 86 34 16 | 3449 |
| 18 | Spica | W. | 76 45 53 | 3056 | 78 14 57 | 3052 | 79 44 6 | 3047 | 81 13 21 | 3042 |
| | Jupiter | W. | 37 29 57 | 3112 | 38 57 52 | 3105 | 40 25 56 | 3096 | 41 54 10 | 3087 |
| | Antares | W. | 30 51 59 | 3056 | 32 21 2 | 3052 | 33 50 10 | 3047 | 35 19 25 | 3042 |
| | Sun | E. | 79 47 2 | 3433 | 78 25 23 | 3429 | 77 3 39 | 3423 | 75 41 49 | 3418 |
| 19 | Spica | W. | 88 41 23 | 3009 | 90 11 25 | 3001 | 91 41 37 | 2992 | 93 12 0 | 2984 |
| | Jupiter | W. | 49 17 59 | 3043 | 50 47 18 | 3034 | 52 16 49 | 3024 | 53 46 32 | 3014 |
| | Antares | W. | 42 47 27 | 3009 | 44 17 29 | 3001 | 45 47 41 | 2993 | 47 18 3 | 2984 |
| | Sun | E. | 68 50 50 | 3381 | 67 28 12 | 3373 | 66 5 25 | 3364 | 64 42 27 | 3355 |
| 20 | Spica | W. | 100 46 45 | 2935 | 102 18 20 | 2924 | 103 50 9 | 2912 | 105 22 12 | 2901 |
| | Jupiter | W. | 61 18 24 | 2959 | 62 49 28 | 2947 | 64 20 47 | 2935 | 65 52 21 | 2924 |
| | Antares | W. | 54 52 47 | 2935 | 56 24 22 | 2924 | 57 56 11 | 2912 | 59 28 14 | 2901 |
| | Sun | E. | 57 44 46 | 3300 | 56 20 35 | 3289 | 54 56 11 | 3276 | 53 31 32 | 3265 |
| 21 | Spica | W. | 113 6 15 | 2840 | 114 39 51 | 2827 | 116 13 44 | 2814 | 117 47 54 | 2800 |
| | Jupiter | W. | 73 34 10 | 2859 | 75 7 22 | 2845 | 76 40 51 | 2831 | 78 14 38 | 2818 |
| | Antares | W. | 67 12 15 | 2840 | 68 45 51 | 2827 | 70 19 44 | 2814 | 71 53 54 | 2800 |
| | Sun | E. | 46 24 33 | 3198 | 44 58 21 | 3184 | 43 31 53 | 3169 | 42 5 7 | 3155 |
| 22 | Jupiter | W. | 86 8 2 | 2748 | 87 43 38 | 2734 | 89 19 33 | 2719 | 90 55 47 | 2705 |
| | Antares | W. | 79 49 11 | 2732 | 81 25 9 | 2718 | 83 1 25 | 2704 | 84 38 0 | 2689 |
| | α Aquilæ | W. | 41 46 37 | 5241 | 42 40 28 | 5072 | 43 36 27 | 4916 | 44 34 29 | 4775 |
| | Sun | E. | 34 46 53 | 3081 | 33 18 20 | 3065 | 31 49 28 | 3050 | 30 20 17 | 3035 |
| 23 | Antares | W. | 92 45 40 | 2620 | 94 24 8 | 2606 | 96 2 55 | 2592 | 97 42 1 | 2577 |
| | α Aquilæ | W. | 49 51 35 | 4216 | 50 59 46 | 4129 | 52 9 20 | 4046 | 53 20 14 | 3970 |
| 27 | Sun | W. | 28 3 18 | 2604 | 29 42 8 | 2599 | 31 21 5 | 2594 | 33 0 8 | 2589 |
| | Regulus | E. | 112 29 16 | 2294 | 110 43 8 | 2289 | 108 56 53 | 2285 | 107 10 31 | 2280 |
| 28 | Sun | W. | 41 16 48 | 2572 | 42 56 21 | 2570 | 44 35 57 | 2569 | 46 15 35 | 2566 |
| | Pollux | E. | 61 29 11 | 2264 | 59 42 19 | 2262 | 57 55 24 | 2260 | 56 8 26 | 2260 |
| | Regulus | E. | 98 17 17 | 2264 | 96 30 25 | 2263 | 94 43 31 | 2261 | 92 56 34 | 2260 |
| 29 | Sun | W. | 54 34 12 | 2564 | 56 13 57 | 2564 | 57 53 42 | 2564 | 59 33 26 | 2565 |
| | Pollux | E. | 47 13 19 | 2258 | 45 26 17 | 2258 | 43 39 15 | 2259 | 41 52 15 | 2260 |
| | Regulus | E. | 84 1 26 | 2257 | 82 14 23 | 2257 | 80 27 20 | 2258 | 78 40 18 | 2258 |
| 30 | Sun | W. | 67 51 43 | 2573 | 69 31 15 | 2575 | 71 10 44 | 2577 | 72 50 10 | 2580 |
| | Venus | W. | 25 31 11 | 2642 | 27 9 9 | 2643 | 28 47 7 | 2643 | 30 25 4 | 2644 |
| | Pollux | E. | 32 57 47 | 2270 | 31 11 3 | 2273 | 29 24 24 | 2276 | 27 37 49 | 2279 |
| | Regulus | E. | 69 45 33 | 2266 | 67 58 43 | 2268 | 66 11 57 | 2270 | 64 25 14 | 2273 |
| | Spica | E. | 123 45 53 | 2262 | 121 58 58 | 2264 | 120 12 6 | 2266 | 118 25 17 | 2269 |
| 31 | Sun | W. | 81 6 20 | 2596 | 82 45 21 | 2599 | 84 24 17 | 2603 | 86 3 8 | 2607 |
| | Venus | W. | 38 34 18 | 2655 | 40 11 59 | 2657 | 41 49 37 | 2660 | 43 27 11 | 2663 |
| | Regulus | E. | 55 32 41 | 2289 | 53 46 25 | 2292 | 52 0 14 | 2296 | 50 14 8 | 2300 |
| | Spica | E. | 109 32 12 | 2283 | 107 45 48 | 2287 | 105 59 29 | 2290 | 104 13 15 | 2294 |

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S Apparent Right Ascension. | THE SUN'S Diff. for 1 hour. | THE SUN'S Apparent Declination. | THE SUN'S Diff. for 1 hour. | THE SUN'S Semi-diameter. | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be added to* / *subtracted from* *Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Sat. | 1 | 0 44 32.88 | 9.100 | N. 4 47 29.4 | +57.72 | 16 1.90 | 64.51 | 3 47.65 | 0.754 |
| *Sun.* | 2 | 0 48 11.35 | 9.105 | 5 10 31.8 | 57.49 | 16 1.63 | 64.53 | 3 29.61 | 0.749 |
| Mon. | 3 | 0 51 49.94 | 9.111 | 5 33 28.5 | 57.25 | 16 1.36 | 64.55 | 3 11.70 | 0.743 |
| Tues. | 4 | 0 55 28.66 | 9.117 | 5 56 19.4 | 56.99 | 16 1.09 | 64.58 | 2 53.92 | 0.737 |
| Wed. | 5 | 0 59 7.56 | 9.124 | 6 19 4.2 | 56.72 | 16 0.82 | 64.61 | 2 36.31 | 0.730 |
| Thur. | 6 | 1 2 46.65 | 9.132 | 6 41 42.3 | 56.44 | 16 0.55 | 64.64 | 2 18.88 | 0.722 |
| Frid. | 7 | 1 6 25.94 | 9.141 | 7 4 13.3 | 56.15 | 16 0.28 | 64.67 | 2 1.66 | 0.713 |
| Sat. | 8 | 1 10 5.45 | 9.150 | 7 26 37.2 | 55.84 | 16 0.01 | 64.71 | 1 44.66 | 0.703 |
| *Sun.* | 9 | 1 13 45.19 | 9.161 | 7 48 53.6 | 55.52 | 15 59.74 | 64.75 | 1 27.90 | 0.692 |
| Mon. | 10 | 1 17 25.20 | 9.173 | 8 11 2.3 | 55.19 | 15 59.46 | 64.79 | 1 11.41 | 0.681 |
| Tues. | 11 | 1 21 5.52 | 9.186 | 8 33 2.7 | 54.85 | 15 59.18 | 64.83 | 0 55.21 | 0.668 |
| Wed. | 12 | 1 24 46.16 | 9.199 | 8 54 54.6 | 54.49 | 15 58.91 | 64.88 | 0 39.34 | 0.655 |
| Thur. | 13 | 1 28 27.12 | 9.213 | 9 16 37.7 | 54.12 | 15 58.64 | 64.92 | 0 23.78 | 0.641 |
| Frid. | 14 | 1 32 8.41 | 9.228 | 9 38 11.9 | 53.73 | 15 58.37 | 64.97 | 0 8.56 | 0.626 |
| Sat. | 15 | 1 35 50.06 | 9.243 | 9 59 36.7 | 53.33 | 15 58.10 | 65.02 | 0 6.30 | 0.611 |
| *Sun.* | 16 | 1 39 32.08 | 9.259 | 10 20 51.7 | 52.92 | 15 57.83 | 65.08 | 0 20.79 | 0.595 |
| Mon. | 17 | 1 43 14.51 | 9.276 | 10 41 56.4 | 52.49 | 15 57.56 | 65.13 | 0 34.88 | 0.579 |
| Tues. | 18 | 1 46 57.35 | 9.293 | 11 2 50.8 | 52.05 | 15 57.29 | 65.19 | 0 48.55 | 0.562 |
| Wed. | 19 | 1 50 40.62 | 9.311 | 11 23 34.6 | 51.59 | 15 57.02 | 65.25 | 1 1.80 | 0.544 |
| Thur. | 20 | 1 54 24.31 | 9.329 | 11 44 7.2 | 51.12 | 15 56.76 | 65.31 | 1 14.64 | 0.526 |
| Frid. | 21 | 1 58 8.44 | 9.348 | 12 4 28.0 | 50.63 | 15 56.51 | 65.37 | 1 27.03 | 0.507 |
| Sat. | 22 | 2 1 53.03 | 9.368 | 12 24 37.2 | 50.13 | 15 56.24 | 65.44 | 1 38.96 | 0.487 |
| *Sun.* | 23 | 2 5 38.10 | 9.388 | 12 44 24.3 | 49.61 | 15 55.99 | 65.51 | 1 50.41 | 0.467 |
| Mon. | 24 | 2 9 23.64 | 9.408 | 13 4 18.9 | 49.08 | 15 55.74 | 65.58 | 2 1.39 | 0.447 |
| Tues. | 25 | 2 13 9.66 | 9.428 | 13 23 50.5 | 48.53 | 15 55.49 | 65.65 | 2 11.89 | 0.427 |
| Wed. | 26 | 2 16 56.16 | 9.448 | 13 43 8.7 | 47.97 | 15 55.24 | 65.72 | 2 21.93 | 0 407 |
| Thur. | 27 | 2 20 43.15 | 9.468 | 14 2 13.4 | 47.41 | 15 55.00 | 65.79 | 2 31.47 | 0.387 |
| Frid. | 28 | 2 24 30.64 | 9.489 | 14 21 4.2 | 46.82 | 15 54.76 | 65.87 | 2 40.51 | 0.366 |
| Sat. | 29 | 2 28 18.63 | 9.510 | 14 39 40.8 | 46.22 | 15 54.52 | 65.95 | 2 49.04 | 0.345 |
| *Sun.* | 30 | 2 32 7.14 | 9.532 | 14 58 2.8 | 45.61 | 15 54.29 | 66.03 | 2 57.07 | 0.323 |
| Mon. | 31 | 2 35 56.17 | 9.553 | N.15 16 9.8 | +44.98 | 15 54.06 | 66.11 | 3 4.58 | 0.302 |

**Note.**—Mean Time of the Semidiameter passing may be found by subtracting 0ˢ.18 from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing.

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, *to be subtracted from* / *added to* *Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | | | |
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Sat. | 1 | 0 44 32.31 | 9.102 | N. 4 47 25.8 | +57.73 | 3 47.70 | 0.754 | 0 40 44.61 |
| *Sun.* | 2 | 0 48 10.83 | 9.107 | 5 10 28.5 | 57.50 | 3 29.66 | 0.749 | 0 44 41.17 |
| Mon. | 3 | 0 51 49.46 | 9.113 | 5 33 25.6 | 57.26 | 3 11.74 | 0.743 | 0 48 37.72 |
| Tues. | 4 | 0 55 28.23 | 9.119 | 5 56 16.7 | 57.00 | 2 53.95 | 0.737 | 0 52 34.28 |
| Wed. | 5 | 0 59 7.17 | 9.126 | 6 19 1.7 | 56.73 | 2 36.34 | 0.730 | 0 56 30.83 |
| Thur. | 6 | 1 2 46.30 | 9.134 | 6 41 40.1 | 56.45 | 2 18.91 | 0.722 | 1 0 27.39 |
| Frid. | 7 | 1 6 25.63 | 9.143 | 7 4 11.4 | 56.16 | 2 1.69 | 0.713 | 1 4 23.94 |
| Sat. | 8 | 1 10 5.18 | 9.152 | 7 26 35.6 | 55.85 | 1 44.68 | 0.703 | 1 8 20.50 |
| *Sun.* | 9 | 1 13 44.96 | 9.163 | 7 48 52.3 | 55.53 | 1 27.91 | 0.692 | 1 12 17.05 |
| Mon. | 10 | 1 17 25.03 | 9.175 | 8 11 1.2 | 55.20 | 1 11.42 | 0.681 | 1 16 13.61 |
| Tues. | 11 | 1 21 5.38 | 9.188 | 8 33 1.8 | 54.86 | 0 55.22 | 0.668 | 1 20 10.16 |
| Wed. | 12 | 1 24 46.06 | 9.201 | 8 54 54.0 | 54.50 | 0 39.35 | 0.655 | 1 24 6.71 |
| Thur. | 13 | 1 28 27.04 | 9.215 | 9 16 37.4 | 54.13 | 0 23.78 | 0.641 | 1 28 3.26 |
| Frid. | 14 | 1 32 8.38 | 9.230 | 9 38 11.8 | 53.74 | 0 8.56 | 0.626 | 1 31 59.82 |
| Sat. | 15 | 1 35 50.07 | 9.245 | 9 59 36.8 | 53.34 | 0 6.30 | 0.611 | 1 35 56.37 |
| *Sun.* | 16 | 1 39 32.13 | 9.261 | 10 20 52.0 | 52.93 | 0 20.80 | 0.595 | 1 39 52.93 |
| Mon. | 17 | 1 43 14.60 | 9.277 | 10 41 56.9 | 52.50 | 0 34.88 | 0.579 | 1 43 49.48 |
| Tues. | 18 | 1 46 57.48 | 9.294 | 11 2 51.5 | 52.06 | 0 48.56 | 0.562 | 1 47 46.04 |
| Wed. | 19 | 1 50 40.78 | 9.312 | 11 23 35.5 | 51.60 | 1 1.81 | 0.544 | 1 51 42.59 |
| Thur. | 20 | 1 54 24.50 | 9.330 | 11 44 8.2 | 51.13 | 1 14.65 | 0.526 | 1 55 39.15 |
| Frid. | 21 | 1 58 8.66 | 9.349 | 12 4 29.2 | 50.64 | 1 27.04 | 0.507 | 1 59 35.70 |
| Sat. | 22 | 2 1 53.29 | 9.369 | 12 24 38.6 | 50.14 | 1 38.97 | 0.487 | 2 3 32.26 |
| *Sun.* | 23 | 2 5 38.39 | 9.389 | 12 44 35.8 | 49.62 | 1 50.42 | 0.467 | 2 7 28.81 |
| Mon. | 24 | 2 9 23.96 | 9.409 | 13 4 20.5 | 49.09 | 2 1.41 | 0.447 | 2 11 25.37 |
| Tues. | 25 | 2 13 10.01 | 9.429 | 13 23 52.1 | 48.54 | 2 11.91 | 0.427 | 2 15 21.92 |
| Wed. | 26 | 2 16 56.54 | 9.449 | 13 43 10.6 | 47.98 | 2 21.94 | 0.407 | 2 19 18.48 |
| Thur. | 27 | 2 20 43.55 | 9.469 | 14 2 15.4 | 47.41 | 2 31.48 | 0.307 | 2 23 15.03 |
| Frid. | 28 | 2 24 31.06 | 9.490 | 14 21 6.3 | 46.82 | 2 40.53 | 0.366 | 2 27 11.59 |
| Sat. | 29 | 2 28 19.08 | 9.511 | 14 39 43.0 | 46.22 | 2 49.06 | 0.345 | 2 31 8.14 |
| *Sun.* | 30 | 2 32 7.61 | 9.533 | 14 58 5.2 | 45.61 | 2 57.09 | 0.323 | 2 35 4.70 |
| Mon. | 31 | 2 35 56.66 | 9.554 | N.15 16 12.2 | +44.98 | 3 4.60 | 0.302 | 2 39 1.26 |

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour. $+9^s.8565$

AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S *True* LONGITUDE. λ | THE SUN'S *True* LONGITUDE. λ′ | THE SUN'S Diff. for 1 hour. | THE SUN'S LATITUDE. | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 92 | 12 6 54.4 | 6 41.8 | 147.79 | +0.78 | 0.0000414 | +51.0 | 23 15 26.15 |
| 2 | 93 | 13 6 0.4 | 5 47.7 | 147.70 | 0.75 | .0001636 | 51.0 | 23 11 30.24 |
| 3 | 94 | 14 5 4.1 | 4 51.4 | 147.61 | 0.67 | .0002863 | 51.0 | 23 7 34.32 |
| 4 | 95 | 15 4 5.6 | 3 52.7 | 147.52 | 0.58 | .0004084 | 51.0 | 23 3 38.42 |
| 5 | 96 | 16 3 4.8 | 2 51.8 | 147.43 | 0.48 | .0005209 | 51.1 | 22 59 42.51 |
| 6 | 97 | 17 2 1.8 | 1 48.7 | 147.33 | 0.36 | .0006536 | 51.2 | 22 55 46.60 |
| 7 | 98 | 18 0 56.6 | 0 43.4 | 147.24 | 0.23 | .0007766 | 51.4 | 22 51 50.69 |
| 8 | 99 | 18 59 49.3 | 59 36.0 | 147.15 | +0.10 | .0009000 | 51.5 | 22 47 54.78 |
| 9 | 100 | 19 58 39.9 | 58 26.5 | 147.06 | −0.03 | .0010236 | 51.6 | 22 43 58.88 |
| 10 | 101 | 20 57 28.4 | 57 14.9 | 146.98 | 0.13 | .0011475 | 51.6 | 22 40 2.97 |
| 11 | 102 | 21 56 15.0 | 56 1.4 | 146.90 | 0.24 | .0012714 | 51.6 | 22 36 7.06 |
| 12 | 103 | 22 54 59.9 | 54 46.2 | 146.83 | 0.30 | .0013954 | 51.6 | 22 32 11.15 |
| 13 | 104 | 23 53 43.0 | 53 29.2 | 146.76 | 0.34 | .0015193 | 51.6 | 22 28 15.25 |
| 14 | 105 | 24 52 24.3 | 52 10.3 | 146.70 | 0.35 | .0016431 | 51.5 | 22 24 19.34 |
| 15 | 106 | 25 51 3.9 | 50 49.8 | 146.62 | 0.32 | .0017666 | 51.3 | 22 20 23.43 |
| 16 | 107 | 26 49 41.8 | 49 27.6 | 146.54 | 0.28 | .0018897 | 51.1 | 22 16 27.52 |
| 17 | 108 | 27 48 18.1 | 48 3.8 | 146.47 | 0.20 | .0020122 | 50.9 | 22 12 31.61 |
| 18 | 109 | 28 46 52.7 | 46 38.3 | 146.41 | −0.11 | .0021339 | 50.6 | 22 8 35.70 |
| 19 | 110 | 29 45 25.7 | 45 11.1 | 146.34 | +0.01 | .0022548 | 50.1 | 22 4 39.79 |
| 20 | 111 | 30 43 57.0 | 43 42.2 | 146.26 | 0.14 | .0023746 | 49.6 | 22 0 43.88 |
| 21 | 112 | 31 42 26.5 | 42 11.6 | 146.19 | 0.28 | .0024931 | 49.1 | 21 56 47.98 |
| 22 | 113 | 32 40 54.3 | 40 39.3 | 146.12 | 0.42 | .0026102 | 48.5 | 21 52 52.07 |
| 23 | 114 | 33 39 20.3 | 39 5.2 | 146.05 | 0.53 | .0027260 | 47.9 | 21 48 56.16 |
| 24 | 115 | 34 37 44.5 | 37 29.2 | 145.97 | 0.63 | .0028404 | 47.3 | 21 45 0.25 |
| 25 | 116 | 35 36 6.8 | 35 51.3 | 145.89 | 0.72 | .0029532 | 46.7 | 21 41 4.34 |
| 26 | 117 | 36 34 27.3 | 34 11.7 | 145.81 | 0.77 | .0030645 | 46.1 | 21 37 8.43 |
| 27 | 118 | 37 32 45.9 | 32 30.2 | 145.73 | 0.81 | .0031742 | 45.5 | 21 33 12.52 |
| 28 | 119 | 38 31 2.5 | 30 46.7 | 145.65 | 0.81 | .0032826 | 44.9 | 21 29 16.61 |
| 29 | 120 | 39 29 16.9 | 29 0.9 | 145.56 | 0.76 | .0033899 | 44.3 | 21 25 20.71 |
| 30 | 121 | 40 27 29.3 | 27 13.1 | 145.47 | 0.71 | .0034959 | 43.8 | 21 21 24.80 |
| 31 | 122 | 41 25 39.7 | 25 23.4 | 145.38 | +0.62 | 0.0036006 | +43.3 | 21 17 28.89 |

**Note:** λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
—9ˢ.8296

## GREENWICH MEAN TIME.

### THE MOON'S

| Day of the Month. | SEMIDIAMETER. |  | HORIZONTAL PARALLAX. |  |  |  | MERIDIAN PASSAGE. |  | AGE. |
|---|---|---|---|---|---|---|---|---|---|
|  | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. |  | Diff. for 1 hour. | Noon. |
|  | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 16 10.2 | 16 8.4 | 59 14.2 | −0.50 | 59 7.7 | −0.58 | 6 19.4 | 2.58 | 6.7 |
| 2 | 16 6.4 | 16 4.1 | 59 0.2 | 0.66 | 58 51.8 | 0.74 | 7 19.6 | 2.42 | 7.7 |
| 3 | 16 1.6 | 15 58.8 | 58 42.5 | 0.81 | 58 32.4 | 0.88 | 8 15.4 | 2.23 | 8.7 |
| 4 | 15 55.8 | 15 52.7 | 58 21.4 | 0.95 | 58 9.7 | 1.01 | 9 6.7 | 2.05 | 9.7 |
| 5 | 15 49.2 | 15 45.6 | 57 57.2 | 1.07 | 57 44.0 | 1.13 | 9 54.3 | 1.92 | 10.7 |
| 6 | 15 41.9 | 15 37.9 | 57 30.1 | 1.19 | 57 15.5 | 1.24 | 10 39.4 | 1.84 | 11.7 |
| 7 | 15 33.8 | 15 29.5 | 57 0.3 | 1.29 | 56 44.7 | 1.31 | 11 23.2 | 1.81 | 12.7 |
| 8 | 15 25.2 | 15 20.8 | 56 28.9 | 1.33 | 56 12.9 | 1.34 | 12 6.8 | 1.83 | 13.7 |
| 9 | 15 16.5 | 15 12.2 | 55 56.9 | 1.32 | 55 41.3 | 1.28 | 12 51.3 | 1.89 | 14.7 |
| 10 | 15 8.2 | 15 4.2 | 55 26.2 | 1.23 | 55 11.8 | 1.17 | 13 37.5 | 1.97 | 15.7 |
| 11 | 15 0.6 | 14 57.3 | 54 58.3 | 1.07 | 54 46.2 | 0.95 | 14 25.7 | 2.06 | 16.7 |
| 12 | 14 54.4 | 14 52.0 | 54 35.5 | 0.82 | 54 26.6 | 0.67 | 15 15.9 | 2.13 | 17.7 |
| 13 | 14 50.0 | 14 48.6 | 54 19.5 | 0.50 | 54 14.6 | −0.32 | 16 7.4 | 2.16 | 18.7 |
| 14 | 14 47.9 | 14 47.8 | 54 11.9 | −0.13 | 54 11.5 | +0.07 | 16 59.2 | 2.14 | 19.7 |
| 15 | 14 48.4 | 14 49.6 | 54 13.6 | +0.28 | 54 18.2 | 0.49 | 17 50.1 | 2.08 | 20.7 |
| 16 | 14 51.6 | 14 54.3 | 54 25.4 | 0.71 | 54 35.2 | 0.93 | 18 39.2 | 2.00 | 21.7 |
| 17 | 14 57.7 | 15 1.7 | 54 47.6 | 1.14 | 55 2.4 | 1.33 | 19 26.4 | 1.92 | 22.7 |
| 18 | 15 6.3 | 15 11.5 | 55 19.4 | 1.51 | 55 38.6 | 1.68 | 20 11.8 | 1.86 | 23.7 |
| 19 | 15 17.3 | 15 23.4 | 55 59.7 | 1.83 | 56 22.4 | 1.95 | 20 56.1 | 1.83 | 24.7 |
| 20 | 15 30.0 | 15 36.7 | 56 46.4 | 2.04 | 57 11.2 | 2.09 | 21 40.2 | 1.85 | 25.7 |
| 21 | 15 43.5 | 15 50.4 | 57 36.3 | 2.10 | 58 1.3 | 2.06 | 22 25.4 | 1.92 | 26.7 |
| 22 | 15 57.0 | 16 3.2 | 58 25.5 | 1.97 | 58 48.5 | 1.85 | 23 13.1 | 2.05 | 27.7 |
| 23 | 16 9.0 | 16 14.1 | 59 9.7 | 1.68 | 59 28.6 | 1.47 |  |  | 28.7 |
| 24 | 16 18.6 | 16 22.2 | 59 44.8 | 1.23 | 59 58.0 | 0.97 | 0 4.5 | 2.24 | 0.2 |
| 25 | 16 24.8 | 16 26.6 | 60 7.9 | 0.68 | 60 14.2 | +0.38 | 1 0.6 | 2.45 | 1.2 |
| 26 | 16 27.4 | 16 27.2 | 60 17.1 | +0.09 | 60 16.5 | −0.18 | 2 1.7 | 2.64 | 2.2 |
| 27 | 16 26.2 | 16 24.4 | 60 12.8 | −0.44 | 60 6.1 | 0.67 | 3 6.3 | 2.72 | 3.2 |
| 28 | 16 21.8 | 16 18.7 | 59 56.9 | 0.87 | 59 45.3 | 1.05 | 4 11.4 | 2.68 | 4.2 |
| 29 | 16 15.0 | 16 11.0 | 59 31.9 | 1.18 | 59 17.1 | 1.28 | 5 13.9 | 2.51 | 5.2 |
| 30 | 16 6.7 | 16 2.2 | 59 1.2 | 1.36 | 58 44.6 | 1.41 | 6 11.7 | 2.29 | 6.2 |
| 31 | 15 57.5 | 15 52.8 | 58 27.5 | −1.43 | 58 10.3 | −1.44 | 7 4.3 | 2.09 | 7.2 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| SATURDAY 1. | | | | | MONDAY 3. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 6 44 22.46 | 2.6648 | N.28 15 20.7 | 3.327 | 0 | 8 46 0.81 | 2.3738 | N.22 15 16.7 | 11.119 |
| 1 | 6 47 2.24 | 2.6612 | 28 11 55.3 | 3.519 | 1 | 8 48 23.02 | 2.3666 | 22 4 5.8 | 11.242 |
| 2 | 6 49 41.80 | 2.6573 | 28 8 18.4 | 3.710 | 2 | 8 50 44.80 | 2.3593 | 21 52 47.6 | 11.364 |
| 3 | 6 52 21.12 | 2.6533 | 28 4 30.1 | 3.900 | 3 | 8 53 6.14 | 2.3521 | 21 41 22.1 | 11.485 |
| 4 | 6 55 0.20 | 2.6493 | 28 0 30.4 | 4.091 | 4 | 8 55 27.05 | 2.3449 | 21 29 49.4 | 11.603 |
| 5 | 6 57 39.04 | 2.6452 | 27 56 19.2 | 4.281 | 5 | 8 57 47.53 | 2.3377 | 21 18 9.7 | 11.720 |
| 6 | 7 0 17.63 | 2.6409 | 27 51 56.7 | 4.468 | 6 | 9 0 7.58 | 2.3306 | 21 6 23.0 | 11.836 |
| 7 | 7 2 55.95 | 2.6364 | 27 47 23.0 | 4.655 | 7 | 9 2 27.20 | 2.3234 | 20 54 29.4 | 11.949 |
| 8 | 7 5 33.99 | 2.6317 | 27 42 38.1 | 4.840 | 8 | 9 4 46.39 | 2.3162 | 20 42 29.1 | 12.061 |
| 9 | 7 8 11.75 | 2.6269 | 27 37 42.2 | 5.024 | 9 | 9 7 5.15 | 2.3091 | 20 30 22.1 | 12.172 |
| 10 | 7 10 49.22 | 2.6220 | 27 32 35.2 | 5.208 | 10 | 9 9 23.48 | 2.3020 | 20 18 8.5 | 12.280 |
| 11 | 7 13 26.39 | 2.6169 | 27 27 17.2 | 5.391 | 11 | 9 11 41.39 | 2.2950 | 20 5 48.5 | 12.387 |
| 12 | 7 16 3.25 | 2.6117 | 27 21 48.3 | 5.572 | 12 | 9 13 58.88 | 2.2880 | 19 53 22.1 | 12.493 |
| 13 | 7 18 39.80 | 2.6065 | 27 16 8.6 | 5.752 | 13 | 9 16 15.95 | 2.2810 | 19 40 49.4 | 12.596 |
| 14 | 7 21 16.03 | 2.6012 | 27 10 18.1 | 5.931 | 14 | 9 18 32.60 | 2.2740 | 19 28 10.6 | 12.696 |
| 15 | 7 23 51.94 | 2.5957 | 27 4 16.9 | 6.108 | 15 | 9 20 48.83 | 2.2671 | 19 15 25.9 | 12.795 |
| 16 | 7 26 27.51 | 2.5900 | 26 58 5.1 | 6.284 | 16 | 9 23 4.65 | 2.2602 | 19 2 35.2 | 12.894 |
| 17 | 7 29 2.74 | 2.5843 | 26 51 42.8 | 6.458 | 17 | 9 25 20.06 | 2.2534 | 18 49 38.6 | 12.991 |
| 18 | 7 31 37.63 | 2.5786 | 26 45 10.1 | 6.632 | 18 | 9 27 35.06 | 2.2466 | 18 36 36.3 | 13.085 |
| 19 | 7 34 12.17 | 2.5726 | 26 38 27.0 | 6.804 | 19 | 9 29 49.65 | 2.2399 | 18 23 28.4 | 13.178 |
| 20 | 7 36 46.34 | 2.5665 | 26 31 33.6 | 6.975 | 20 | 9 32 3.84 | 2.2332 | 18 10 14.9 | 13.270 |
| 21 | 7 39 20.15 | 2.5604 | 26 24 30.0 | 7.144 | 21 | 9 34 17.63 | 2.2265 | 17 56 56.0 | 13.360 |
| 22 | 7 41 53.59 | 2.5542 | 26 17 16.3 | 7.312 | 22 | 9 36 31.02 | 2.2199 | 17 43 31.7 | 13.448 |
| 23 | 7 44 26.65 | 2.5479 | N.26 9 52.6 | 7.478 | 23 | 9 38 44.02 | 2.2134 | N.17 30 2.2 | 13.534 |
| SUNDAY 2. | | | | | TUESDAY 4. | | | | |
| 0 | 7 46 59.34 | 2.5416 | N.26 2 19.0 | 7.643 | 0 | 9 40 56.63 | 2.2069 | N.17 16 27.6 | 13.619 |
| 1 | 7 49 31.65 | 2.5351 | 25 54 35.5 | 7.806 | 1 | 9 43 8.85 | 2.2004 | 17 2 47.9 | 13.702 |
| 2 | 7 52 3.56 | 2.5285 | 25 46 42.3 | 7.967 | 2 | 9 45 20.68 | 2.1940 | 16 49 3.3 | 13.783 |
| 3 | 7 54 35.07 | 2.5219 | 25 38 39.4 | 8.128 | 3 | 9 47 32.13 | 2.1877 | 16 35 13.9 | 13.863 |
| 4 | 7 57 6.19 | 2.5153 | 25 30 26.9 | 8.287 | 4 | 9 49 43.20 | 2.1814 | 16 21 19.7 | 13.942 |
| 5 | 7 59 36.91 | 2.5087 | 25 22 4.9 | 8.444 | 5 | 9 51 53.90 | 2.1753 | 16 7 20.9 | 14.018 |
| 6 | 8 2 7.23 | 2.5019 | 25 13 33.6 | 8.599 | 6 | 9 54 4.24 | 2.1692 | 15 53 17.5 | 14.093 |
| 7 | 8 4 37.14 | 2.4951 | 25 4 53.0 | 8.754 | 7 | 9 56 14.21 | 2.1631 | 15 39 9.7 | 14.167 |
| 8 | 8 7 6.64 | 2.4882 | 24 56 3.2 | 8.906 | 8 | 9 58 23.81 | 2.1570 | 15 24 57.5 | 14.238 |
| 9 | 8 9 35.72 | 2.4812 | 24 47 4.3 | 9.057 | 9 | 10 0 33.05 | 2.1511 | 15 10 41.1 | 14.308 |
| 10 | 8 12 4.39 | 2.4742 | 24 37 56.4 | 9.206 | 10 | 10 2 41.94 | 2.1452 | 14 56 20.5 | 14.377 |
| 11 | 8 14 32.63 | 2.4672 | 24 28 39.6 | 9.353 | 11 | 10 4 50.48 | 2.1394 | 14 41 55.8 | 14.444 |
| 12 | 8 17 0.45 | 2.4602 | 24 19 14.0 | 9.499 | 12 | 10 6 58.67 | 2.1337 | 14 27 27.2 | 14.509 |
| 13 | 8 19 27.85 | 2.4531 | 24 9 39.7 | 9.643 | 13 | 10 9 6.52 | 2.1280 | 14 12 54.7 | 14.573 |
| 14 | 8 21 54.82 | 2.4459 | 23 59 56.8 | 9.786 | 14 | 10 11 14.03 | 2.1224 | 13 58 18.4 | 14.636 |
| 15 | 8 24 21.36 | 2.4387 | 23 50 5.4 | 9.927 | 15 | 10 13 21.21 | 2.1169 | 13 43 38.4 | 14.697 |
| 16 | 8 26 47.47 | 2.4316 | 23 40 5.6 | 10.066 | 16 | 10 15 28.06 | 2.1114 | 13 28 54.8 | 14.756 |
| 17 | 8 29 13.15 | 2.4245 | 23 29 57.5 | 10.204 | 17 | 10 17 34.58 | 2.1059 | 13 14 7.7 | 14.814 |
| 18 | 8 31 38.41 | 2.4173 | 23 19 41.1 | 10.341 | 18 | 10 19 40.77 | 2.1006 | 12 59 17.1 | 14.871 |
| 19 | 8 34 3.23 | 2.4101 | 23 9 16.6 | 10.471 | 19 | 10 21 46.65 | 2.0954 | 12 44 23.2 | 14.925 |
| 20 | 8 36 27.62 | 2.4028 | 22 58 44.2 | 10.606 | 20 | 10 23 52.22 | 2.0902 | 12 29 26.1 | 14.977 |
| 21 | 8 38 51.57 | 2.3955 | 22 48 3.9 | 10.736 | 21 | 10 25 57.48 | 2.0852 | 12 14 25.9 | 15.029 |
| 22 | 8 41 15.08 | 2.3883 | 22 37 15.9 | 10.865 | 22 | 10 28 2.44 | 2.0802 | 11 59 22.6 | 15.080 |
| 23 | 8 43 38.16 | 2.3811 | 22 26 20.1 | 10.993 | 23 | 10 30 7.10 | 2.0752 | 11 44 16.3 | 15.128 |
| 24 | 8 46 0.81 | 2.3738 | N.22 15 16.7 | 11.119 | 24 | 10 32 11.46 | 2.0703 | N.11 29 7.2 | 15.175 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | WEDNESDAY 5. | | | | | FRIDAY 7. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 10 32 11.46 | 2.0703 | N.11 29 7.2 | 15.175 | 0 | 12 7 28.51 | 1.9307 | S. 1 7 19.3 | 15.843 |
| 1 | 10 34 15.53 | 2.0655 | 11 13 55.3 | 15.221 | 1 | 12 9 24.32 | 1.9297 | 1 23 9.4 | 15.827 |
| 2 | 10 36 19.32 | 2.0609 | 10 58 40.7 | 15.266 | 2 | 12 11 20.07 | 1.9287 | 1 38 58.5 | 15.809 |
| 3 | 10 38 22.84 | 2.0563 | 10 43 23.4 | 15.309 | 3 | 12 13 15.77 | 1.9279 | 1 54 46.5 | 15.790 |
| 4 | 10 40 26.08 | 2.0517 | 10 28 3.6 | 15.349 | 4 | 12 15 11.42 | 1.9272 | 2 10 33.3 | 15.769 |
| 5 | 10 42 29.04 | 2.0471 | 10 12 41.5 | 15.388 | 5 | 12 17 7.03 | 1.9266 | 2 26 18.8 | 15.748 |
| 6 | 10 44 31.73 | 2.0427 | 9 57 17.0 | 15.427 | 6 | 12 19 2.61 | 1.9260 | 2 42 3.1 | 15.727 |
| 7 | 10 46 34.16 | 2.0384 | 9 41 50.2 | 15.465 | 7 | 12 20 58.15 | 1.9254 | 2 57 46.0 | 15.703 |
| 8 | 10 48 36.34 | 2.0342 | 9 26 21.2 | 15.500 | 8 | 12 22 53.66 | 1.9249 | 3 13 27.4 | 15.678 |
| 9 | 10 50 38.27 | 2.0301 | 9 10 50.2 | 15.534 | 9 | 12 24 49.14 | 1.9245 | 3 29 7.3 | 15.652 |
| 10 | 10 52 39.95 | 2.0260 | 8 55 17.1 | 15.567 | 10 | 12 26 44.60 | 1.9243 | 3 44 45.6 | 15.625 |
| 11 | 10 54 41.39 | 2.0220 | 8 39 42.1 | 15.599 | 11 | 12 28 40.05 | 1.9241 | 4 0 22.3 | 15.597 |
| 12 | 10 56 42.59 | 2.0181 | 8 24 5.2 | 15.629 | 12 | 12 30 35.49 | 1.9239 | 4 15 57.3 | 15.568 |
| 13 | 10 58 43.56 | 2.0143 | 8 8 26.6 | 15.657 | 13 | 12 32 30.92 | 1.9238 | 4 31 30.5 | 15.538 |
| 14 | 11 0 44.30 | 2.0105 | 7 52 46.3 | 15.685 | 14 | 12 34 26.35 | 1.9237 | 4 47 1.9 | 15.507 |
| 15 | 11 2 44.82 | 2.0068 | 7 37 4.4 | 15.711 | 15 | 12 36 21.77 | 1.9237 | 5 2 31.3 | 15.474 |
| 16 | 11 4 45.12 | 2.0032 | 7 21 21.0 | 15.735 | 16 | 12 38 17.20 | 1.9239 | 5 17 58.7 | 15.440 |
| 17 | 11 6 45.21 | 1.9997 | 7 5 36.2 | 15.758 | 17 | 12 40 12.64 | 1.9242 | 5 33 24.1 | 15.406 |
| 18 | 11 8 45.08 | 1.9962 | 6 49 50.0 | 15.780 | 18 | 12 42 8.10 | 1.9244 | 5 48 47.4 | 15.370 |
| 19 | 11 10 44.75 | 1.9929 | 6 34 2.6 | 15.800 | 19 | 12 44 3.57 | 1.9247 | 6 4 8.5 | 15.333 |
| 20 | 11 12 44.23 | 1.9896 | 6 18 14.0 | 15.820 | 20 | 12 45 59.07 | 1.9252 | 6 19 27.4 | 15.296 |
| 21 | 11 14 43.51 | 1.9864 | 6 2 24.2 | 15.838 | 21 | 12 47 54.59 | 1.9256 | 6 34 44.0 | 15.257 |
| 22 | 11 16 42.60 | 1.9833 | 5 46 33.4 | 15.854 | 22 | 12 49 50.14 | 1.9261 | 6 49 58.2 | 15.217 |
| 23 | 11 18 41.51 | 1.9803 | N. 5 30 41.7 | 15.869 | 23 | 12 51 45.72 | 1.9267 | S. 7 5 10.0 | 15.175 |
| | THURSDAY 6. | | | | | SATURDAY 8. | | | |
| 0 | 11 20 40.24 | 1.9773 | N. 5 14 49.1 | 15.883 | 0 | 12 53 41.34 | 1.9273 | S. 7 20 19.2 | 15.133 |
| 1 | 11 22 38.79 | 1.9745 | 4 58 55.7 | 15.896 | 1 | 12 55 37.00 | 1.9281 | 7 35 25.9 | 15.090 |
| 2 | 11 24 37.18 | 1.9717 | 4 43 1.6 | 15.907 | 2 | 12 57 32.71 | 1.9289 | 7 50 30.0 | 15.046 |
| 3 | 11 26 35.40 | 1.9690 | 4 27 6.8 | 15.917 | 3 | 12 59 28.47 | 1.9297 | 8 5 31.4 | 15.001 |
| 4 | 11 28 33.46 | 1.9664 | 4 11 11.5 | 15.926 | 4 | 13 1 24.28 | 1.9307 | 8 20 30.1 | 14.954 |
| 5 | 11 30 31.37 | 1.9639 | 3 55 15.7 | 15.934 | 5 | 13 3 20.15 | 1.9317 | 8 35 25.9 | 14.907 |
| 6 | 11 32 29.13 | 1.9614 | 3 39 19.4 | 15.941 | 6 | 13 5 16.09 | 1.9328 | 8 50 18.9 | 14.859 |
| 7 | 11 34 26.74 | 1.9590 | 3 23 22.8 | 15.946 | 7 | 13 7 12.09 | 1.9339 | 9 5 9.0 | 14.809 |
| 8 | 11 36 24.21 | 1.9568 | 3 7 25.9 | 15.949 | 8 | 13 9 8.16 | 1.9350 | 9 19 56.0 | 14.758 |
| 9 | 11 38 21.55 | 1.9546 | 2 51 28.9 | 15.951 | 9 | 13 11 4.29 | 1.9362 | 9 34 40.0 | 14.707 |
| 10 | 11 40 18.76 | 1.9524 | 2 35 31.8 | 15.952 | 10 | 13 13 0.50 | 1.9375 | 9 49 20.9 | 14.654 |
| 11 | 11 42 15.83 | 1.9502 | 2 19 34.6 | 15.953 | 11 | 13 14 56.79 | 1.9389 | 10 3 58.5 | 14.600 |
| 12 | 11 44 12.78 | 1.9482 | 2 3 37.4 | 15.952 | 12 | 13 16 53.17 | 1.9404 | 10 18 32.9 | 14.546 |
| 13 | 11 46 9.61 | 1.9463 | 1 47 40.3 | 15.949 | 13 | 13 18 49.64 | 1.9418 | 10 33 4.0 | 14.490 |
| 14 | 11 48 6.34 | 1.9446 | 1 31 43.5 | 15.945 | 14 | 13 20 46.19 | 1.9433 | 10 47 31.7 | 14.433 |
| 15 | 11 50 2.96 | 1.9429 | 1 15 46.9 | 15.941 | 15 | 13 22 42.83 | 1.9449 | 11 1 56.0 | 14.376 |
| 16 | 11 51 59.48 | 1.9412 | 0 59 50.6 | 15.935 | 16 | 13 24 39.57 | 1.9466 | 11 16 16.8 | 14.317 |
| 17 | 11 53 55.90 | 1.9396 | 0 43 54.7 | 15.927 | 17 | 13 26 36.42 | 1.9483 | 11 30 34.1 | 14.258 |
| 18 | 11 55 52.23 | 1.9381 | 0 27 59.3 | 15.919 | 18 | 13 28 33.37 | 1.9501 | 11 44 47.8 | 14.197 |
| 19 | 11 57 48.47 | 1.9367 | N. 0 12 4.4 | 15.910 | 19 | 13 30 30.43 | 1.9519 | 11 58 57.8 | 14.136 |
| 20 | 11 59 44.63 | 1.9353 | S. 0 3 49.9 | 15.898 | 20 | 13 32 27.60 | 1.9538 | 12 13 4.1 | 14.073 |
| 21 | 12 1 40.70 | 1.9339 | 0 19 43.4 | 15.886 | 21 | 13 34 24.88 | 1.9557 | 12 27 6.6 | 14.009 |
| 22 | 12 3 36.70 | 1.9328 | 0 35 36.2 | 15.873 | 22 | 13 36 22.28 | 1.9577 | 12 41 5.2 | 13.944 |
| 23 | 12 5 32.64 | 1.9317 | 0 51 28.2 | 15.859 | 23 | 13 38 19.80 | 1.9596 | 12 54 59.9 | 13.879 |
| 24 | 12 7 28.51 | 1.9307 | S. 1 7 19.3 | 15.843 | 24 | 13 40 17.43 | 1.9616 | S. 13 8 50.7 | 13.813 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SUNDAY 9.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 13 40 17.43 | 1.9616 | S.13 8 50.7 | 13.813 |
| 1 | 13 42 15.19 | 1.9638 | 13 22 37.5 | 13.745 |
| 2 | 13 44 13.08 | 1.9660 | 13 36 20.1 | 13.676 |
| 3 | 13 46 11.11 | 1.9682 | 13 49 58.6 | 13.607 |
| 4 | 13 48 9.27 | 1.9705 | 14 3 32.9 | 13.536 |
| 5 | 13 50 7.57 | 1.9728 | 14 17 2.9 | 13.465 |
| 6 | 13 52 6.01 | 1.9752 | 14 30 28.7 | 13.393 |
| 7 | 13 54 4.59 | 1.9776 | 14 43 50.1 | 13.319 |
| 8 | 13 56 3.32 | 1.9801 | 14 57 7.0 | 13.244 |
| 9 | 13 58 2.20 | 1.9826 | 15 10 19.4 | 13.168 |
| 10 | 14 0 1.23 | 1.9851 | 15 23 27.2 | 13.092 |
| 11 | 14 2 0.41 | 1.9876 | 15 36 30.5 | 13.016 |
| 12 | 14 3 59.74 | 1.9902 | 15 49 29.1 | 12.938 |
| 13 | 14 5 59.23 | 1.9929 | 16 2 23.0 | 12.858 |
| 14 | 14 7 58.89 | 1.9956 | 16 15 12.1 | 12.778 |
| 15 | 14 9 58.71 | 1.9983 | 16 27 56.4 | 12.697 |
| 16 | 14 11 58.69 | 2.0011 | 16 40 35.8 | 12.615 |
| 17 | 14 13 58.84 | 2.0039 | 16 53 10.2 | 12.532 |
| 18 | 14 15 59.16 | 2.0068 | 17 5 39.7 | 12.449 |
| 19 | 14 17 59.65 | 2.0097 | 17 18 4.1 | 12.364 |
| 20 | 14 20 0.32 | 2.0126 | 17 30 23.4 | 12.279 |
| 21 | 14 22 1.16 | 2.0155 | 17 42 37.6 | 12.193 |
| 22 | 14 24 2.18 | 2.0185 | 17 54 46.6 | 12.105 |
| 23 | 14 26 3.38 | 2.0215 | S.18 6 50.2 | 12.016 |

### MONDAY 10.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 14 28 4.76 | 2.0245 | S.18 18 48.5 | 11.927 |
| 1 | 14 30 6.32 | 2.0276 | 18 30 41.4 | 11.837 |
| 2 | 14 32 8.07 | 2.0307 | 18 42 28.9 | 11.747 |
| 3 | 14 34 10.00 | 2.0338 | 18 54 11.0 | 11.655 |
| 4 | 14 36 12.12 | 2.0369 | 19 5 47.5 | 11.562 |
| 5 | 14 38 14.43 | 2.0400 | 19 17 18.4 | 11.468 |
| 6 | 14 40 16.92 | 2.0431 | 19 28 43.6 | 11.373 |
| 7 | 14 42 19.60 | 2.0463 | 19 40 3.2 | 11.278 |
| 8 | 14 44 22.48 | 2.0496 | 19 51 17.0 | 11.182 |
| 9 | 14 46 25.56 | 2.0529 | 20 2 25.0 | 11.085 |
| 10 | 14 48 28.83 | 2.0562 | 20 13 27.2 | 10.987 |
| 11 | 14 50 32.30 | 2.0594 | 20 24 23.4 | 10.888 |
| 12 | 14 52 35.96 | 2.0627 | 20 35 13.7 | 10.788 |
| 13 | 14 54 39.82 | 2.0660 | 20 45 58.0 | 10.687 |
| 14 | 14 56 43.88 | 2.0692 | 20 56 36.2 | 10.586 |
| 15 | 14 58 48.13 | 2.0725 | 21 7 8.3 | 10.484 |
| 16 | 15 0 52.58 | 2.0758 | 21 17 34.3 | 10.382 |
| 17 | 15 2 57.23 | 2.0792 | 21 27 54.1 | 10.278 |
| 18 | 15 5 2.09 | 2.0826 | 21 38 7.6 | 10.173 |
| 19 | 15 7 7.15 | 2.0859 | 21 48 14.8 | 10.068 |
| 20 | 15 9 12.40 | 2.0892 | 21 58 15.7 | 9.962 |
| 21 | 15 11 17.85 | 2.0925 | 22 8 10.2 | 9.854 |
| 22 | 15 13 23.50 | 2.0959 | 22 17 58.2 | 9.746 |
| 23 | 15 15 29.36 | 2.0993 | 22 27 39.7 | 9.637 |
| 24 | 15 17 35.42 | 2.1027 | S.22 37 14.7 | 9.528 |

### TUESDAY 11.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 15 17 35.42 | 2.1027 | S.22 37 14.7 | 9.528 |
| 1 | 15 19 41.68 | 2.1060 | 22 46 43.1 | 9.418 |
| 2 | 15 21 48.14 | 2.1092 | 22 56 4.8 | 9.307 |
| 3 | 15 23 54.79 | 2.1125 | 23 5 19.9 | 9.196 |
| 4 | 15 26 1.64 | 2.1159 | 23 14 28.3 | 9.083 |
| 5 | 15 28 8.70 | 2.1193 | 23 23 29.9 | 8.970 |
| 6 | 15 30 15.96 | 2.1227 | 23 32 24.7 | 8.856 |
| 7 | 15 32 23.42 | 2.1259 | 23 41 12.6 | 8.742 |
| 8 | 15 34 31.07 | 2.1291 | 23 49 53.7 | 8.627 |
| 9 | 15 36 38.91 | 2.1324 | 23 58 27.8 | 8.510 |
| 10 | 15 38 46.95 | 2.1356 | 24 6 54.9 | 8.393 |
| 11 | 15 40 55.18 | 2.1387 | 24 15 15.0 | 8.276 |
| 12 | 15 43 3.60 | 2.1419 | 24 23 28.0 | 8.158 |
| 13 | 15 45 12.21 | 2.1452 | 24 31 33.9 | 8.039 |
| 14 | 15 47 21.02 | 2.1484 | 24 39 32.7 | 7.919 |
| 15 | 15 49 30.02 | 2.1515 | 24 47 24.2 | 7.798 |
| 16 | 15 51 39.20 | 2.1546 | 24 55 8.5 | 7.678 |
| 17 | 15 53 48.57 | 2.1577 | 25 2 45.6 | 7.558 |
| 18 | 15 55 58.13 | 2.1608 | 25 10 15.4 | 7.436 |
| 19 | 15 58 7.87 | 2.1638 | 25 17 37.9 | 7.312 |
| 20 | 16 0 17.79 | 2.1667 | 25 24 52.9 | 7.188 |
| 21 | 16 2 27.88 | 2.1697 | 25 32 0.5 | 7.064 |
| 22 | 16 4 38.15 | 2.1727 | 25 39 0.6 | 6.939 |
| 23 | 16 6 48.60 | 2.1756 | S.25 45 53.2 | 6.815 |

### WEDNESDAY 12.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 16 8 59.22 | 2.1784 | S.25 52 38.4 | 6.690 |
| 1 | 16 11 10.01 | 2.1812 | 25 59 16.0 | 6.563 |
| 2 | 16 13 20.97 | 2.1840 | 26 5 46.0 | 6.436 |
| 3 | 16 15 32.09 | 2.1868 | 26 12 8.3 | 6.308 |
| 4 | 16 17 43.38 | 2.1895 | 26 18 23.0 | 6.181 |
| 5 | 16 19 54.83 | 2.1921 | 26 24 30.0 | 6.053 |
| 6 | 16 22 6.43 | 2.1947 | 26 30 29.3 | 5.923 |
| 7 | 16 24 18.19 | 2.1972 | 26 36 20.8 | 5.793 |
| 8 | 16 26 30.10 | 2.1997 | 26 42 4.5 | 5.664 |
| 9 | 16 28 42.16 | 2.2022 | 26 47 40.5 | 5.534 |
| 10 | 16 30 54.37 | 2.2047 | 26 53 8.6 | 5.403 |
| 11 | 16 33 6.72 | 2.2070 | 26 58 28.8 | 5.271 |
| 12 | 16 35 19.21 | 2.2093 | 27 3 41.1 | 5.139 |
| 13 | 16 37 31.84 | 2.2116 | 27 8 45.5 | 5.007 |
| 14 | 16 39 44.60 | 2.2138 | 27 13 41.9 | 4.873 |
| 15 | 16 41 57.49 | 2.2159 | 27 18 30.3 | 4.740 |
| 16 | 16 44 10.51 | 2.2180 | 27 23 10.7 | 4.607 |
| 17 | 16 46 23.65 | 2.2200 | 27 27 43.2 | 4.474 |
| 18 | 16 48 36.91 | 2.2219 | 27 32 7.6 | 4.339 |
| 19 | 16 50 50.28 | 2.2238 | 27 36 23.9 | 4.204 |
| 20 | 16 53 3.77 | 2.2257 | 27 40 32.1 | 4.069 |
| 21 | 16 55 17.37 | 2.2275 | 27 44 32.2 | 3.934 |
| 22 | 16 57 31.07 | 2.2292 | 27 48 24.2 | 3.798 |
| 23 | 16 59 44.87 | 2.2308 | 27 52 8.0 | 3.662 |
| 24 | 17 1 58.77 | 2.2324 | S.27 55 43.6 | 3.525 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| THURSDAY 13. | | | | | SATURDAY 15. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 17 1 58.77 | 2.2324 | S.27 55 43.6 | 3.525 | 0 | 18 49 35.87 | 2.2239 | S.28 5 23.5 | 3.109 |
| 1 | 17 4 12.76 | 2.2339 | 27 59 11.0 | 3.389 | 1 | 18 51 49.25 | 2.2219 | 28 2 12.9 | 3.244 |
| 2 | 17 6 26.84 | 2.2354 | 28 2 30.3 | 3.252 | 2 | 18 54 2.50 | 2.2198 | 27 58 54.2 | 3.379 |
| 3 | 17 8 41.01 | 2.2368 | 28 5 41.3 | 3.115 | 3 | 18 56 15.63 | 2.2178 | 27 55 27.4 | 3.513 |
| 4 | 17 10 55.26 | 2.2381 | 28 8 44.1 | 2.977 | 4 | 18 58 28.64 | 2.2158 | 27 51 52.6 | 3.647 |
| 5 | 17 13 9.58 | 2.2393 | 28 11 38.6 | 2.839 | 5 | 19 0 41.53 | 2.2137 | 27 48 9.8 | 3.780 |
| 6 | 17 15 23.97 | 2.2404 | 28 14 24.8 | 2.701 | 6 | 19 2 54.29 | 2.2116 | 27 44 19.0 | 3.912 |
| 7 | 17 17 38.43 | 2.2416 | 28 17 2.7 | 2.563 | 7 | 19 5 6.92 | 2.2093 | 27 40 20.3 | 4.045 |
| 8 | 17 19 52.96 | 2.2427 | 28 19 32.4 | 2.426 | 8 | 19 7 19.41 | 2.2070 | 27 36 13.6 | 4.177 |
| 9 | 17 22 7.55 | 2.2436 | 28 21 53.8 | 2.288 | 9 | 19 9 31.76 | 2.2047 | 27 31 59.0 | 4.309 |
| 10 | 17 24 22.19 | 2.2444 | 28 24 6.9 | 2.149 | 10 | 19 11 43.97 | 2.2023 | 27 27 36.5 | 4.440 |
| 11 | 17 26 36.88 | 2.2453 | 28 26 11.7 | 2.010 | 11 | 19 13 56.04 | 2.1999 | 27 23 6.2 | 4.571 |
| 12 | 17 28 51.63 | 2.2462 | 28 28 8.1 | 1.871 | 12 | 19 16 7.96 | 2.1974 | 27 18 28.0 | 4.702 |
| 13 | 17 31 6.42 | 2.2467 | 28 29 56.2 | 1.732 | 13 | 19 18 19.73 | 2.1949 | 27 13 42.0 | 4.832 |
| 14 | 17 33 21.24 | 2.2472 | 28 31 35.9 | 1.592 | 14 | 19 20 31.35 | 2.1923 | 27 8 48.2 | 4.961 |
| 15 | 17 35 36.09 | 2.2477 | 28 33 7.3 | 1.453 | 15 | 19 22 42.81 | 2.1897 | 27 3 46.7 | 5.090 |
| 16 | 17 37 50.97 | 2.2482 | 28 34 30.3 | 1.313 | 16 | 19 24 54.11 | 2.1870 | 26 58 37.4 | 5.218 |
| 17 | 17 40 5.88 | 2.2487 | 28 35 44.9 | 1.174 | 17 | 19 27 5.25 | 2.1843 | 26 53 20.5 | 5.346 |
| 18 | 17 42 20.81 | 2.2489 | 28 36 51.2 | 1.035 | 18 | 19 29 16.23 | 2.1816 | 26 47 55.9 | 5.474 |
| 19 | 17 44 35.75 | 2.2491 | 28 37 49.1 | 0.895 | 19 | 19 31 27.04 | 2.1788 | 26 42 23.6 | 5.602 |
| 20 | 17 46 50.70 | 2.2493 | 28 38 38.6 | 0.756 | 20 | 19 33 37.69 | 2.1761 | 26 36 43.7 | 5.728 |
| 21 | 17 49 5.67 | 2.2495 | 28 39 19.8 | 0.617 | 21 | 19 35 48.17 | 2.1733 | 26 30 56.3 | 5.853 |
| 22 | 17 51 20.64 | 2.2494 | 28 39 52.6 | 0.477 | 22 | 19 37 58.48 | 2.1704 | 26 25 1.3 | 5.979 |
| 23 | 17 53 35.60 | 2.2492 | S.28 40 17.0 | 0.337 | 23 | 19 40 8.62 | 2.1675 | S.26 18 58.8 | 6.103 |
| FRIDAY 14. | | | | | SUNDAY 16. | | | | |
| 0 | 17 55 50.55 | 2.2491 | S.28 40 33.1 | 0.198 | 0 | 19 42 18.58 | 2.1645 | S.26 12 48.9 | 6.227 |
| 1 | 17 58 5.49 | 2.2489 | 28 40 40.8 | −0.058 | 1 | 19 44 28.36 | 2.1615 | 26 6 31.5 | 6.352 |
| 2 | 18 0 20.42 | 2.2487 | 28 40 40.1 | +0.082 | 2 | 19 46 37.96 | 2.1586 | 26 0 6.7 | 6.476 |
| 3 | 18 2 35.33 | 2.2483 | 28 40 31.0 | 0.221 | 3 | 19 48 47.39 | 2.1557 | 25 53 34.4 | 6.599 |
| 4 | 18 4 50.21 | 2.2478 | 28 40 13.6 | 0.359 | 4 | 19 50 56.64 | 2.1526 | 25 46 54.8 | 6.721 |
| 5 | 18 7 5.06 | 2.2473 | 28 39 47.9 | 0.498 | 5 | 19 53 5.70 | 2.1494 | 25 40 7.9 | 6.842 |
| 6 | 18 9 19.88 | 2.2467 | 28 39 13.8 | 0.637 | 6 | 19 55 14.57 | 2.1463 | 25 33 13.7 | 6.963 |
| 7 | 18 11 34.66 | 2.2459 | 28 38 31.4 | 0.777 | 7 | 19 57 23.26 | 2.1432 | 25 26 12.3 | 7.083 |
| 8 | 18 13 49.39 | 2.2452 | 28 37 40.6 | 0.916 | 8 | 19 59 31.76 | 2.1402 | 25 19 3.7 | 7.203 |
| 9 | 18 16 4.08 | 2.2444 | 28 36 41.5 | 1.054 | 9 | 20 1 40.08 | 2.1371 | 25 11 47.9 | 7.323 |
| 10 | 18 18 18.72 | 2.2435 | 28 35 34.1 | 1.193 | 10 | 20 3 48.21 | 2.1339 | 25 4 24.9 | 7.442 |
| 11 | 18 20 33.30 | 2.2425 | 28 34 18.4 | 1.332 | 11 | 20 5 56.15 | 2.1307 | 24 56 54.8 | 7.560 |
| 12 | 18 22 47.82 | 2.2415 | 28 32 54.3 | 1.470 | 12 | 20 8 3.89 | 2.1274 | 24 49 17.7 | 7.678 |
| 13 | 18 25 2.28 | 2.2404 | 28 31 22.0 | 1.607 | 13 | 20 10 11.44 | 2.1243 | 24 41 33.5 | 7.795 |
| 14 | 18 27 16.67 | 2.2392 | 28 29 41.4 | 1.745 | 14 | 20 12 18.80 | 2.1212 | 24 33 42.3 | 7.911 |
| 15 | 18 29 30.98 | 2.2379 | 28 27 52.6 | 1.882 | 15 | 20 14 25.98 | 2.1180 | 24 25 44.2 | 8.026 |
| 16 | 18 31 45.21 | 2.2366 | 28 25 55.5 | 2.020 | 16 | 20 16 32.96 | 2.1147 | 24 17 39.2 | 8.141 |
| 17 | 18 33 59.37 | 2.2352 | 28 23 50.2 | 2.157 | 17 | 20 18 39.75 | 2.1115 | 24 9 27.3 | 8.256 |
| 18 | 18 36 13.44 | 2.2337 | 28 21 36.6 | 2.295 | 18 | 20 20 46.34 | 2.1083 | 24 1 8.5 | 8.370 |
| 19 | 18 38 27.42 | 2.2322 | 28 19 14.8 | 2.432 | 19 | 20 22 52.74 | 2.1051 | 23 52 42.9 | 8.483 |
| 20 | 18 40 41.31 | 2.2307 | 28 16 44.8 | 2.568 | 20 | 20 24 58.95 | 2.1018 | 23 44 10.5 | 8.596 |
| 21 | 18 42 55.10 | 2.2290 | 28 14 6.7 | 2.703 | 21 | 20 27 4.96 | 2.0986 | 23 35 31.4 | 8.707 |
| 22 | 18 45 8.79 | 2.2273 | 28 11 20.4 | 2.839 | 22 | 20 29 10.78 | 2.0953 | 23 26 45.6 | 8.818 |
| 23 | 18 47 22.38 | 2.2256 | 28 8 26.0 | 2.974 | 23 | 20 31 16.40 | 2.0921 | 23 17 53.2 | 8.929 |
| 24 | 18 49 35.87 | 2.2239 | S.28 5 23.5 | 3.109 | 24 | 20 33 21.83 | 2.0889 | S.23 8 54.1 | 9.040 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | **MONDAY 17.** | | | | | **WEDNESDAY 19.** | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 20 33 21.83 | 2.0889 | S. 23 8 54.1 | 9.040 | 0 | 22 10 19.09 | 1.9642 | S. 14 1 28.0 | 13.493 |
| 1 | 20 35 27.07 | 2.0857 | 22 59 48.4 | 9.149 | 1 | 22 12 16.89 | 1.9627 | 13 47 56.2 | 13.567 |
| 2 | 20 37 32.11 | 2.0824 | 22 50 36.2 | 9.257 | 2 | 22 14 14.61 | 1.9612 | 13 34 20.0 | 13.641 |
| 3 | 20 39 36.96 | 2.0792 | 22 41 17.6 | 9.364 | 3 | 22 16 12.24 | 1.9598 | 13 20 39.3 | 13.714 |
| 4 | 20 41 41.62 | 2.0761 | 22 31 52.5 | 9.472 | 4 | 22 18 9.79 | 1.9585 | 13 6 54.3 | 13 786 |
| 5 | 20 43 46.09 | 2.0730 | 22 22 20.9 | 9.580 | 5 | 22 20 7.26 | 1.9571 | 12 53 5.0 | 13.857 |
| 6 | 20 45 50.38 | 2.0699 | 22 12 42.9 | 9.686 | 6 | 22 22 4.65 | 1.9558 | 12 39 11.4 | 13.928 |
| 7 | 20 47 54.48 | 2.0667 | 22 2 58.6 | 9.791 | 7 | 22 24 1.96 | 1.9546 | 12 25 13.6 | 13.997 |
| 8 | 20 49 58.38 | 2.0634 | 21 53 8.0 | 9.895 | 8 | 22 25 59.20 | 1.9535 | 12 11 11.7 | 14.066 |
| 9 | 20 52 2.09 | 2.0603 | 21 43 11.2 | 9.998 | 9 | 22 27 56.38 | 1.9525 | 11 57 5.7 | 14.134 |
| 10 | 20 54 5.62 | 2.0572 | 21 33 8.2 | 10.102 | 10 | 22 29 53.50 | 1.9515 | 11 42 55.6 | 14.202 |
| 11 | 20 56 8.96 | 2.0542 | 21 22 59.0 | 10.205 | 11 | 22 31 50.56 | 1.9506 | 11 28 41.5 | 14.268 |
| 12 | 20 58 12.12 | 2.0512 | 21 12 43.6 | 10.307 | 12 | 22 33 47.57 | 1.9497 | 11 14 23.5 | 14.333 |
| 13 | 21 0 15.10 | 2.0482 | 21 2 22.1 | 10.408 | 13 | 22 35 44.53 | 1.9489 | 11 0 1.6 | 14.398 |
| 14 | 21 2 17.90 | 2.0451 | 20 51 54.6 | 10.508 | 14 | 22 37 41.44 | 1 9482 | 10 45 35.8 | 14.462 |
| 15 | 21 4 20.51 | 2.0420 | 20 41 21.2 | 10.607 | 15 | 22 39 38.31 | 1.9475 | 10 31 6.2 | 14.524 |
| 16 | 21 6 22.94 | 2.0391 | 20 30 41.8 | 10.707 | 16 | 22 41 35.14 | 1.9469 | 10 16 32.9 | 14.586 |
| 17 | 21 8 25.20 | 2.0362 | 20 19 56.4 | 10.806 | 17 | 22 43 31.94 | 1.9464 | 10 1 55.9 | 14.647 |
| 18 | 21 10 27.29 | 2.0334 | 20 9 5.1 | 10.903 | 18 | 22 45 28.71 | 1.9459 | 9 47 15.2 | 14.708 |
| 19 | 21 12 29.21 | 2.0305 | 19 58 8.0 | 11.000 | 19 | 22 47 25.45 | 1.9455 | 9 32 30.9 | 14.767 |
| 20 | 21 14 30.95 | 2.0276 | 19 47 5.1 | 11.097 | 20 | 22 49 22.17 | 1.9452 | 9 17 43.1 | 14.825 |
| 21 | 21 16 32.52 | 2.0247 | 19 35 56.4 | 11.192 | 21 | 22 51 18.88 | 1.9450 | 9 2 51.9 | 14.882 |
| 22 | 21 18 33.92 | 2.0219 | 19 24 42.0 | 11.287 | 22 | 22 53 15.57 | 1.9448 | 8 47 57.2 | 14.939 |
| 23 | 21 20 35.15 | 2.0192 | S. 19 13 22.0 | 11.380 | 23 | 22 55 12.25 | 1.9447 | S. 8 32 59.2 | 14.995 |
| | **TUESDAY 18.** | | | | | **THURSDAY 20.** | | | |
| 0 | 21 22 36.22 | 2.0165 | S. 19 1 56.4 | 11.473 | 0 | 22 57 8.93 | 1.9447 | S. 8 17 57.8 | 15.051 |
| 1 | 21 24 37.13 | 2.0138 | 18 50 25.2 | 11.566 | 1 | 22 59 5.61 | 1.9447 | 8 2 53.1 | 15.105 |
| 2 | 21 26 37.88 | 2.0112 | 18 38 48.4 | 11.659 | 2 | 23 1 2.29 | 1.9447 | 7 47 45.2 | 15.158 |
| 3 | 21 28 38.47 | 2.0086 | 18 27 6.1 | 11.750 | 3 | 23 2 58.98 | 1.9449 | 7 32 34.2 | 15.209 |
| 4 | 21 30 38.91 | 2.0060 | 18 15 18.4 | 11.840 | 4 | 23 4 55.68 | 1.9452 | 7 17 20.2 | 15.259 |
| 5 | 21 32 39.19 | 2.0034 | 18 3 25.3 | 11.930 | 5 | 23 6 52.40 | 1.9456 | 7 2 3.1 | 15.310 |
| 6 | 21 34 39.32 | 2.0010 | 17 51 26.8 | 12.019 | 6 | 23 8 49.15 | 1.9461 | 6 46 43.0 | 15.359 |
| 7 | 21 36 39.31 | 1.9986 | 17 39 23.0 | 12.107 | 7 | 23.10 45.93 | 1.9465 | 6 31 20.0 | 15.407 |
| 8 | 21 38 39.16 | 1.9962 | 17 27 13.9 | 12.195 | 8 | 23 12 42.73 | 1.9469 | 6 15 54.1 | 15.455 |
| 9 | 21 40 38.86 | 1.9938 | 17 14 59.6 | 12.282 | 9 | 23 14 39.56 | 1.9475 | 6 0 25.4 | 15.501 |
| 10 | 21 42 38.42 | 1.9915 | 17 2 40.1 | 12.368 | 10 | 23 16 36.43 | 1.9483 | 5 44 54.0 | 15.546 |
| 11 | 21 44 37.84 | 1.9892 | 16 50 15.4 | 12.453 | 11 | 23 18 33.35 | 1.9492 | 5 29 19.9 | 15.590 |
| 12 | 21 46 37.12 | 1.9869 | 16 37 45.7 | 12.537 | 12 | 23 20 30.33 | 1.9501 | 5 13 43.2 | 15.633 |
| 13 | 21 48 36.27 | 1.9847 | 16 25 11.0 | 12.621 | 13 | 23 22 27.36 | 1.9510 | 4 58 3.9 | 15.676 |
| 14 | 21 50 35.29 | 1.9827 | 16 12 31.2 | 12.705 | 14 | 23 24 24.45 | 1.9519 | 4 42 22.1 | 15.717 |
| 15 | 21 52 34.19 | 1.9807 | 15 59 46.4 | 12.787 | 15 | 23 26 21.59 | 1.9529 | 4 26 37.9 | 15.757 |
| 16 | 21 54 32.97 | 1.9787 | 15 46 56.7 | 12.868 | 16 | 23 28 18.80 | 1.9542 | 4 10 51.3 | 15.796 |
| 17 | 21 56 31.63 | 1.9766 | 15 34 2.2 | 12.949 | 17 | 23 30 16.09 | 1.9555 | 3 55 2.4 | 15.833 |
| 18 | 21 58 30.16 | 1.9746 | 15 21 2.8 | 13.030 | 18 | 23 32 13.46 | 1.9568 | 3 39 11.3 | 15.870 |
| 19 | 22 0 28.58 | 1.9727 | 15 7 58.6 | 13.109 | 19 | 23 34 10.91 | 1.9582 | 3 23 18.0 | 15.906 |
| 20 | 22 2 26.89 | 1.9709 | 14 54 49.7 | 13.187 | 20 | 23 36 8.45 | 1.9597 | 3 7 22.6 | 15.941 |
| 21 | 22 4 25.09 | 1.9692 | 14 41 36.2 | 13.264 | 21 | 23 38 6.08 | 1.9613 | 2 51 25.1 | 15.974 |
| 22 | 22 6 23.19 | 1.9675 | 14 28 18.0 | 13.341 | 22 | 23 40 3.81 | 1.9631 | 2 35 25.7 | 16.006 |
| 23 | 22 8 21.19 | 1.9658 | 14 14 55.3 | 13.417 | 23 | 23 42 1.65 | 1.9648 | 2 19 24.4 | 16.037 |
| 24 | 22 10 19.09 | 1.9642 | S. 14 1 28.0 | 13.492 | 24 | 23 43 59.59 | 1.9666 | S. 2 3 21.2 | 16.068 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### FRIDAY 21.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 23 43 59.59 | 1.9666 | S. 2 3 21.2 | 16.068 |
| 1 | 23 45 57.64 | 1.9685 | 1 47 16.2 | 16.097 |
| 2 | 23 47 55.81 | 1.9706 | 1 31 9.5 | 16.124 |
| 3 | 23 49 54.11 | 1.9727 | 1 15 1.3 | 16.150 |
| 4 | 23 51 52.54 | 1.9748 | 0 58 51.5 | 16.176 |
| 5 | 23 53 51.09 | 1.9769 | 0 42 40.2 | 16.201 |
| 6 | 23 55 49.77 | 1.9792 | 0 26 27.4 | 16.225 |
| 7 | 23 57 48.60 | 1.9817 | S. 0 10 13.2 | 16.247 |
| 8 | 23 59 47.58 | 1.9842 | N. 0 6 2.2 | 16.266 |
| 9 | 0 1 46.71 | 1.9868 | 0 22 18.7 | 16.284 |
| 10 | 0 3 46.00 | 1.9896 | 0 38 36.3 | 16.302 |
| 11 | 0 5 45.46 | 1.9923 | 0 54 55.0 | 16.320 |
| 12 | 0 7 45.08 | 1.9951 | 1 11 14.7 | 16.336 |
| 13 | 0 9 44.87 | 1.9981 | 1 27 35.3 | 16.349 |
| 14 | 0 11 44.85 | 2.0012 | 1 43 56.6 | 16.362 |
| 15 | 0 13 45.01 | 2.0043 | 2 0 18.7 | 16.374 |
| 16 | 0 15 45.36 | 2.0075 | 2 16 41.5 | 16.384 |
| 17 | 0 17 45.91 | 2.0107 | 2 33 4.8 | 16.393 |
| 18 | 0 19 46.65 | 2.0141 | 2 49 28.6 | 16.400 |
| 19 | 0 21 47.60 | 2.0176 | 3 5 52.8 | 16.406 |
| 20 | 0 23 48.76 | 2.0211 | 3 22 17.3 | 16.411 |
| 21 | 0 25 50.13 | 2.0247 | 3 38 42.1 | 16.414 |
| 22 | 0 27 51.72 | 2.0284 | 3 55 7.0 | 16.416 |
| 23 | 0 29 53.54 | 2.0323 | N. 4 11 32.0 | 16.416 |

### SATURDAY 22.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 0 31 55.59 | 2.0362 | N. 4 27 56.9 | 16.414 |
| 1 | 0 33 57.88 | 2.0401 | 4 44 21.7 | 16.412 |
| 2 | 0 36 0.40 | 2.0441 | 5 0 46.3 | 16.408 |
| 3 | 0 38 3.17 | 2.0483 | 5 17 10.7 | 16.403 |
| 4 | 0 40 6.19 | 2.0526 | 5 33 34.7 | 16.396 |
| 5 | 0 42 9.48 | 2.0570 | 5 49 58.2 | 16.387 |
| 6 | 0 44 13.03 | 2.0614 | 6 6 21.1 | 16.377 |
| 7 | 0 46 16.85 | 2.0659 | 6 22 43.4 | 16.365 |
| 8 | 0 48 20.94 | 2.0705 | 6 39 4.9 | 16.352 |
| 9 | 0 50 25.31 | 2.0752 | 6 55 25.6 | 16.337 |
| 10 | 0 52 29.96 | 2.0798 | 7 11 45.3 | 16.320 |
| 11 | 0 54 34.89 | 2.0846 | 7 28 4.0 | 16.302 |
| 12 | 0 56 40.11 | 2.0895 | 7 44 21.6 | 16.282 |
| 13 | 0 58 45.63 | 2.0946 | 8 0 37.9 | 16.261 |
| 14 | 1 0 51.46 | 2.0998 | 8 16 52.9 | 16.238 |
| 15 | 1 2 57.61 | 2.1051 | 8 33 6.5 | 16.213 |
| 16 | 1 5 4.07 | 2.1103 | 8 49 18.5 | 16.187 |
| 17 | 1 7 10.85 | 2.1156 | 9 5 28.9 | 16.158 |
| 18 | 1 9 17.94 | 2.1209 | 9 21 37.5 | 16.128 |
| 19 | 1 11 25.36 | 2.1265 | 9 37 44.2 | 16.096 |
| 20 | 1 13 33.12 | 2.1322 | 9 53 49.0 | 16.063 |
| 21 | 1 15 41.23 | 2.1380 | 10 9 51.8 | 16.028 |
| 22 | 1 17 49.68 | 2.1437 | 10 25 52.4 | 15.991 |
| 23 | 1 19 58.47 | 2.1494 | 10 41 50.7 | 15.952 |
| 24 | 1 22 7.61 | 2.1553 | N.10 57 46.7 | 15.912 |

### SUNDAY 23.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 1 22 7.61 | 2.1553 | N.10 57 46.7 | 15.912 |
| 1 | 1 24 17.11 | 2.1614 | 11 13 40.2 | 15.870 |
| 2 | 1 26 26.98 | 2.1676 | 11 29 31.1 | 15.825 |
| 3 | 1 28 37.22 | 2.1738 | 11 45 19.2 | 15.778 |
| 4 | 1 30 47.83 | 2.1800 | 12 1 4.5 | 15.731 |
| 5 | 1 32 58.82 | 2.1862 | 12 16 46.9 | 15.681 |
| 6 | 1 35 10.18 | 2.1926 | 12 32 26.2 | 15.629 |
| 7 | 1 37 21.93 | 2.1991 | 12 48 2.4 | 15.576 |
| 8 | 1 39 34.07 | 2.2057 | 13 3 35.3 | 15.520 |
| 9 | 1 41 46.61 | 2.2123 | 13 19 4.8 | 15.462 |
| 10 | 1 43 59.55 | 2.2190 | 13 34 30.8 | 15.403 |
| 11 | 1 46 12.89 | 2.2257 | 13 49 53.2 | 15.342 |
| 12 | 1 48 26.64 | 2.2326 | 14 5 11.8 | 15.278 |
| 13 | 1 50 40.80 | 2.2395 | 14 20 26.6 | 15.213 |
| 14 | 1 52 55.38 | 2.2464 | 14 35 37.4 | 15.145 |
| 15 | 1 55 10.37 | 2.2533 | 14 50 44.0 | 15.075 |
| 16 | 1 57 25.78 | 2.2604 | 15 5 46.4 | 15.003 |
| 17 | 1 59 41.62 | 2.2676 | 15 20 44.4 | 14.930 |
| 18 | 2 1 57.89 | 2.2748 | 15 35 38.0 | 14.855 |
| 19 | 2 4 14.59 | 2.2820 | 15 50 27.0 | 14.777 |
| 20 | 2 6 31.73 | 2.2893 | 16 5 11.2 | 14.697 |
| 21 | 2 8 49.31 | 2.2967 | 16 19 50.6 | 14.615 |
| 22 | 2 11 7.33 | 2.3041 | 16 34 25.0 | 14.531 |
| 23 | 2 13 25.80 | 2.3116 | N.16 48 54.3 | 14.445 |

### MONDAY 24.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 2 15 44.72 | 2.3191 | N.17 3 18.4 | 14.357 |
| 1 | 2 18 4.09 | 2.3266 | 17 17 37.1 | 14.266 |
| 2 | 2 20 23.91 | 2.3342 | 17 31 50.3 | 14.174 |
| 3 | 2 22 44.19 | 2.3418 | 17 45 58.0 | 14.080 |
| 4 | 2 25 4.93 | 2.3495 | 17 59 59.9 | 13.983 |
| 5 | 2 27 26.13 | 2.3572 | 18 13 56.0 | 13.885 |
| 6 | 2 29 47.79 | 2.3649 | 18 27 46.1 | 13.784 |
| 7 | 2 32 9.92 | 2.3727 | 18 41 30.1 | 13.681 |
| 8 | 2 34 32.51 | 2.3804 | 18 55 7.8 | 13.575 |
| 9 | 2 36 55.57 | 2.3882 | 19 8 39.1 | 13.467 |
| 10 | 2 39 19.10 | 2.3961 | 19 22 3.9 | 13.358 |
| 11 | 2 41 43.10 | 2.4039 | 19 35 22.1 | 13.247 |
| 12 | 2 44 7.57 | 2.4118 | 19 48 33.5 | 13.133 |
| 13 | 2 46 32.52 | 2.4197 | 20 1 38.0 | 13.017 |
| 14 | 2 48 57.94 | 2.4276 | 20 14 35.5 | 12.898 |
| 15 | 2 51 23.83 | 2.4355 | 20 27 25.8 | 12.778 |
| 16 | 2 53 50.20 | 2.4434 | 20 40 8.9 | 12.656 |
| 17 | 2 56 17.04 | 2.4513 | 20 52 44.5 | 12.531 |
| 18 | 2 58 44.35 | 2.4592 | 21 5 12.6 | 12.404 |
| 19 | 3 1 12.14 | 2.4671 | 21 17 33.0 | 12.275 |
| 20 | 3 3 40.40 | 2.4749 | 21 29 45.6 | 12.144 |
| 21 | 3 6 9.13 | 2.4828 | 21 41 50.3 | 12.012 |
| 22 | 3 8 38.33 | 2.4907 | 21 53 47.0 | 11.877 |
| 23 | 3 11 8.01 | 2.4985 | 22 5 35.5 | 11.738 |
| 24 | 3 13 38.15 | 2.5062 | N.22 17 15.6 | 11.598 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| TUESDAY 25. | | | | | THURSDAY 27. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 3 13 38.15 | 2.5062 | N.22 17 15.6 | 11.598 | 0 | 5 21 24.44 | 2.7675 | N.28 17 49.3 | 2.852 |
| 1 | 3 16 8.75 | 2.5139 | 22 28 47.3 | 11.457 | 1 | 5 24 10.54 | 2.7689 | 28 20 34.1 | 2.642 |
| 2 | 3 18 39.82 | 2.5217 | 22 40 10.5 | 11.314 | 2 | 5 26 56.71 | 2.7700 | 28 23 6.3 | 2.431 |
| 3 | 3 21 11.35 | 2.5294 | 22 51 25.0 | 11.168 | 3 | 5 29 42.94 | 2.7710 | 28 25 25.8 | 2.219 |
| 4 | 3 23 43.35 | 2.5372 | 23 2 30.7 | 11.020 | 4 | 5 32 29.23 | 2.7720 | 28 27 32.6 | 2.007 |
| 5 | 3 26 15.81 | 2.5448 | 23 13 27.4 | 10.869 | 5 | 5 35 15.58 | 2.7728 | 28 29 26.7 | 1.796 |
| 6 | 3 28 48.72 | 2.5523 | 23 24 15.0 | 10.717 | 6 | 5 38 1.97 | 2.7732 | 28 31 8.1 | 1.584 |
| 7 | 3 31 22.08 | 2.5598 | 23 34 53.5 | 10.564 | 7 | 5 40 48.37 | 2.7733 | 28 32 36.8 | 1.373 |
| 8 | 3 33 55.89 | 2.5672 | 23 45 22.7 | 10.408 | 8 | 5 43 34.77 | 2.7733 | 28 33 52.8 | 1.161 |
| 9 | 3 36 30.14 | 2.5745 | 23 55 42.4 | 10.249 | 9 | 5 46 21.17 | 2.7732 | 28 34 56.1 | 0.948 |
| 10 | 3 39 4.83 | 2.5818 | 24 5 52.6 | 10.090 | 10 | 5 49 7.55 | 2.7728 | 28 35 46.6 | 0.736 |
| 11 | 3 41 39.96 | 2.5891 | 24 15 53.2 | 9.928 | 11 | 5 51 53.90 | 2.7722 | 28 36 24.4 | 0.524 |
| 12 | 3 44 15.52 | 2.5962 | 24 25 44.0 | 9.764 | 12 | 5 54 40.21 | 2.7713 | 28 36 49.5 | 0.312 |
| 13 | 3 46 51.51 | 2.6033 | 24 35 24.9 | 9.598 | 13 | 5 57 26.46 | 2.7702 | 28 37 1.9 | +0.101 |
| 14 | 3 49 27.92 | 2.6102 | 24 44 55.8 | 9.431 | 14 | 6 0 12.64 | 2.7689 | 28 37 1.6 | −0.110 |
| 15 | 3 52 4.74 | 2.6171 | 24 54 16.6 | 9.262 | 15 | 6 2 58.73 | 2.7674 | 28 36 48.7 | 0.321 |
| 16 | 3 54 41.97 | 2.6240 | 25 3 27.2 | 9.090 | 16 | 6 5 44.73 | 2.7657 | 28 36 23.1 | 0.532 |
| 17 | 3 57 19.62 | 2.6308 | 25 12 27.4 | 8.917 | 17 | 6 8 30.62 | 2.7639 | 28 35 44.9 | 0.743 |
| 18 | 3 59 57.67 | 2.6374 | 25 21 17.2 | 8.742 | 18 | 6 11 16.40 | 2.7619 | 28 34 54.0 | 0.953 |
| 19 | 4 2 36.11 | 2.6438 | 25 29 56.5 | 8.566 | 19 | 6 14 2.05 | 2.7595 | 28 33 50.5 | 1.162 |
| 20 | 4 5 14.93 | 2.6502 | 25 38 25.1 | 8.387 | 20 | 6 16 47.54 | 2.7568 | 28 32 34.6 | 1.369 |
| 21 | 4 7 54.13 | 2.6564 | 25 46 42.9 | 8.207 | 21 | 6 19 32.87 | 2.7541 | 28 31 6.2 | 1.577 |
| 22 | 4 10 33.70 | 2.6626 | 25 54 49.9 | 8.026 | 22 | 6 22 18.03 | 2.7512 | 28 29 25.3 | 1.785 |
| 23 | 4 13 13.64 | 2.6687 | N.26 2 46.0 | 7.842 | 23 | 6 25 3.02 | 2.7482 | N.28 27 32.0 | 1.991 |
| WEDNESDAY 26. | | | | | FRIDAY 28. | | | | |
| 0 | 4 15 53.94 | 2.6746 | N.26 10 31.0 | 7.657 | 0 | 6 27 47.82 | 2.7449 | N.28 25 26.4 | 2.197 |
| 1 | 4 18 34.59 | 2.6803 | 26 18 4.9 | 7.471 | 1 | 6 30 32.41 | 2.7413 | 28 23 8.4 | 2.403 |
| 2 | 4 21 15.58 | 2.6859 | 26 25 27.5 | 7.282 | 2 | 6 33 16.78 | 2.7376 | 28 20 38.1 | 2.607 |
| 3 | 4 23 56.90 | 2.6914 | 26 32 38.8 | 7.093 | 3 | 6 36 0.92 | 2.7337 | 28 17 55.6 | 2.809 |
| 4 | 4 26 38.55 | 2.6968 | 26 39 38.7 | 6.903 | 4 | 6 38 44.82 | 2.7297 | 28 15 1.0 | 3.011 |
| 5 | 4 29 20.52 | 2.7020 | 26 46 27.1 | 6.711 | 5 | 6 41 28.48 | 2.7255 | 28 11 54.3 | 3.212 |
| 6 | 4 32 2.79 | 2.7070 | 26 53 4.0 | 6.517 | 6 | 6 44 11.88 | 2.7211 | 28 8 35.5 | 3.413 |
| 7 | 4 34 45.36 | 2.7119 | 26 59 29.2 | 6.322 | 7 | 6 46 55.01 | 2.7164 | 28 5 4.7 | 3.612 |
| 8 | 4 37 28.22 | 2.7166 | 27 5 42.7 | 6.126 | 8 | 6 49 37.85 | 2.7116 | 28 1 22.0 | 3.810 |
| 9 | 4 40 11.35 | 2.7211 | 27 11 44.3 | 5.928 | 9 | 6 52 20.40 | 2.7067 | 27 57 27.5 | 4.007 |
| 10 | 4 42 54.75 | 2.7255 | 27 17 34.0 | 5.729 | 10 | 6 55 2.65 | 2.7016 | 27 53 21.2 | 4.202 |
| 11 | 4 45 38.41 | 2.7297 | 27 23 11.8 | 5.530 | 11 | 6 57 44.59 | 2.6963 | 27 49 3.2 | 4.397 |
| 12 | 4 48 22.32 | 2.7338 | 27 28 37.6 | 5.329 | 12 | 7 0 26.21 | 2.6909 | 27 44 33.6 | 4.590 |
| 13 | 4 51 6.47 | 2.7377 | 27 33 51.3 | 5.127 | 13 | 7 3 7.50 | 2.6853 | 27 39 52.4 | 4.782 |
| 14 | 4 53 50.84 | 2.7413 | 27 38 52.9 | 4.924 | 14 | 7 5 48.45 | 2.6796 | 27 34 59.8 | 4.972 |
| 15 | 4 56 35.42 | 2.7447 | 27 43 42.2 | 4.720 | 15 | 7 8 29.05 | 2.6737 | 27 29 55.8 | 5.161 |
| 16 | 4 59 20.20 | 2.7480 | 27 48 19.3 | 4.516 | 16 | 7 11 9.29 | 2.6677 | 27 24 40.5 | 5.349 |
| 17 | 5 2 5.18 | 2.7512 | 27 52 44.1 | 4.311 | 17 | 7 13 49.17 | 2.6616 | 27 19 13.9 | 5.536 |
| 18 | 5 4 50.35 | 2.7542 | 27 56 56.6 | 4.104 | 18 | 7 16 28.68 | 2.6553 | 27 13 36.2 | 5.720 |
| 19 | 5 7 35.69 | 2.7569 | 28 0 56.6 | 3.897 | 19 | 7 19 7.81 | 2.6489 | 27 7 47.5 | 5.903 |
| 20 | 5 10 21.18 | 2.7593 | 28 4 44.2 | 3.689 | 20 | 7 21 46.55 | 2.6423 | 27 1 47.8 | 6.085 |
| 21 | 5 13 6.80 | 2.7615 | 28 8 19.3 | 3.481 | 21 | 7 24 24.89 | 2.6357 | 26 55 37.3 | 6.265 |
| 22 | 5 15 52.56 | 2.7637 | 28 11 41.9 | 3.272 | 22 | 7 27 2.83 | 2.6290 | 26 49 16.0 | 6.444 |
| 23 | 5 18 38.44 | 2.7657 | 28 14 51.9 | 3.062 | 23 | 7 29 40.37 | 2.6222 | 26 42 44.0 | 6.621 |
| 24 | 5 21 24.44 | 2.7675 | N.28 17 49.3 | 2.852 | 24 | 7 32 17.49 | 2.6152 | N.26 36 1.5 | 6.796 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| SATURDAY 29. | | | | | SUNDAY 30. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 7 32 17.49 | 2.6152 | N.26 36 1.5 | 6.796 | 0 | 8 32 51.67 | 2.4276 | N.23 6 40.8 | 10.474 |
| 1 | 7 34 54.19 | 2.6081 | 26 29 8.5 | 6.970 | 1 | 8 35 17.08 | 2.4194 | 22 56 8.4 | 10.605 |
| 2 | 7 37 30.46 | 2.6009 | 26 22 5.1 | 7.142 | 2 | 8 37 42.00 | 2.4112 | 22 45 28.2 | 10.733 |
| 3 | 7 40 6.30 | 2.5937 | 26 14 51.5 | 7.312 | 3 | 8 40 6.42 | 2.4029 | 22 34 40.4 | 10.859 |
| 4 | 7 42 41.70 | 2.5863 | 26 7 27.7 | 7.481 | 4 | 8 42 30.35 | 2.3947 | 22 23 45.1 | 10.983 |
| 5 | 7 45 16.65 | 2.5788 | 25 59 53.8 | 7.648 | 5 | 8 44 53.79 | 2.3866 | 22 12 42.4 | 11.107 |
| 6 | 7 47 51.16 | 2.5714 | 25 52 10.0 | 7.813 | 6 | 8 47 16.74 | 2.3784 | 22 1 32.3 | 11.228 |
| 7 | 7 50 25.22 | 2.5638 | 25 44 16.3 | 7.976 | 7 | 8 49 39.20 | 2.3702 | 21 50 15.1 | 11.346 |
| 8 | 7 52 58.82 | 2.5561 | 25 36 12.9 | 8.137 | 8 | 8 52 1.17 | 2.3621 | 21 38 50.8 | 11.463 |
| 9 | 7 55 31.95 | 2.5483 | 25 27 59.8 | 8.297 | 9 | 8 54 22.65 | 2.3540 | 21 27 19.5 | 11.578 |
| 10 | 7 58 4.62 | 2.5406 | 25 19 37.2 | 8.455 | 10 | 8 56 43.65 | 2.3459 | 21 15 41.4 | 11.692 |
| 11 | 8 0 36.82 | 2.5328 | 25 11 5.2 | 8.612 | 11 | 8 59 4.16 | 2.3378 | 21 3 56.5 | 11.803 |
| 12 | 8 3 8.55 | 2.5249 | 25 2 23.8 | 8.767 | 12 | 9 1 24.19 | 2.3298 | 20 52 5.0 | 11.913 |
| 13 | 8 5 39.81 | 2.5170 | 24 53 33.2 | 8.919 | 13 | 9 3 43.74 | 2.3218 | 20 40 7.0 | 12.021 |
| 14 | 8 8 10.59 | 2.5090 | 24 44 33.5 | 9.069 | 14 | 9 6 2.81 | 2.3138 | 20 28 2.5 | 12.128 |
| 15 | 8 10 40.89 | 2.5009 | 24 35 24.9 | 9.218 | 15 | 9 8 21.40 | 2.3059 | 20 15 51.7 | 12.232 |
| 16 | 8 13 10.70 | 2.4928 | 24 26 7.4 | 9.365 | 16 | 9 10 39.52 | 2.2981 | 20 3 34.7 | 12.333 |
| 17 | 8 15 40.03 | 2.4848 | 24 16 41.1 | 9.511 | 17 | 9 12 57.17 | 2.2902 | 19 51 11.7 | 12.433 |
| 18 | 8 18 8.88 | 2.4767 | 24 7 6.1 | 9.654 | 18 | 9 15 14.35 | 2.2824 | 19 38 42.7 | 12.532 |
| 19 | 8 20 37.24 | 2.4686 | 23 57 22.6 | 9.795 | 19 | 9 17 31.06 | 2.2747 | 19 26 7.8 | 12.630 |
| 20 | 8 23 5.11 | 2.4604 | 23 47 30.7 | 9.935 | 20 | 9 19 47.31 | 2.2670 | 19 13 27.1 | 12.725 |
| 21 | 8 25 32.49 | 2.4522 | 23 37 30.4 | 10.073 | 21 | 9 22 3.10 | 2.2593 | 19 0 40.8 | 12.818 |
| 22 | 8 27 59.38 | 2.4440 | 23 27 21.9 | 10.209 | 22 | 9 24 18.43 | 2.2518 | 18 47 48.9 | 12.911 |
| 23 | 8 30 25.77 | 2.4358 | 23 17 5.3 | 10.342 | 23 | 9 26 33.31 | 2.2443 | 18 34 51.5 | 13.001 |
| 24 | 8 32 51.67 | 2.4276 | N.23 6 40.8 | 10.474 | 24 | 9 28 47.75 | 2.2369 | N.18 21 48.8 | 13.089 |

### PHASES OF THE MOON.

| | d | h | m |
|---|---|---|---|
| ☽ First Quarter, . . . . . . . . . . | 1 | 4 | 12.0 |
| ○ Full Moon, . . . . . . . . . . | 8 | 7 | 39.0 |
| ☾ Last Quarter, . . . . . . . . . . | 16 | 8 | 37.6 |
| ● New Moon, . . . . . . . . . . | 23 | 19 | 3.6 |
| ☽ First Quarter, . . . . . . . . . . | 30 | 10 | 27.1 |

| | d | h |
|---|---|---|
| ☾ Apogee, . . . . . . . . . . . . . . | 14 | 7.7 |
| ☾ Perigee, . . . . . . . . . . . . . . | 26 | 4.2 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L of Diff. | III$^{h}$. | P. L. of Diff. | VI$^{h}$. | P. L. of Diff. | IX$^{h}$. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun | W. | 87° 41′ 53″ | 2611 | 89° 20′ 33″ | 2615 | 90° 59′ 8″ | 2619 | 92° 37′ 37″ | 2624 |
| | Mars | W. | 46 40 42 | 2528 | 48 21 16 | 2532 | 50 1 45 | 2535 | 51 42 9 | 2538 |
| | Venus | W. | 45 4 40 | 2666 | 46 42 5 | 2671 | 48 19 24 | 2675 | 49 56 38 | 2678 |
| | Aldebaran | W. | 33 26 14 | 2533 | 35 6 42 | 2517 | 36 47 32 | 2504 | 38 28 40 | 2493 |
| | Spica | E. | 102 27 7 | 2298 | 100 41 4 | 2301 | 98 55 6 | 2305 | 97 9 14 | 2309 |
| 2 | Sun | W. | 100 48 28 | 2647 | 102 26 19 | 2652 | 104 4 3 | 2657 | 105 41 40 | 2663 |
| | Mars | W. | 60 2 52 | 2559 | 61 42 43 | 2564 | 63 22 28 | 2569 | 65 2 6 | 2573 |
| | Venus | W. | 58 1 27 | 2700 | 59 38 7 | 2705 | 61 14 41 | 2710 | 62 51 8 | 2714 |
| | Aldebaran | W. | 46 57 16 | 2464 | 48 39 20 | 2462 | 50 21 27 | 2460 | 52 3 36 | 2459 |
| | Spica | E. | 88 21 29 | 2331 | 86 36 15 | 2336 | 84 51 8 | 2340 | 83 6 7 | 2346 |
| 3 | Sun | W. | 113 47 57 | 2690 | 115 24 50 | 2696 | 117 1 35 | 2702 | 118 38 12 | 2708 |
| | Mars | W. | 73 18 36 | 2599 | 74 57 32 | 2604 | 76 36 21 | 2610 | 78 15 2 | 2615 |
| | Venus | W. | 70 51 43 | 2741 | 72 27 29 | 2747 | 74 3 7 | 2753 | 75 38 37 | 2758 |
| | Aldebaran | W. | 60 34 21 | 2465 | 62 16 24 | 2467 | 63 58 24 | 2470 | 65 40 20 | 2473 |
| | Spica | E. | 74 22 53 | 2371 | 72 38 37 | 2376 | 70 54 28 | 2382 | 69 10 27 | 2387 |
| | Jupiter | E. | 113 28 11 | 2380 | 111 44 8 | 2385 | 110 0 12 | 2390 | 108 16 23 | 2395 |
| 4 | Sun | W. | 126 39 14 | 2740 | 128 15 1 | 2747 | 129 50 38 | 2754 | 131 26 6 | 2761 |
| | Mars | W. | 86 26 29 | 2646 | 88 4 21 | 2653 | 89 42 4 | 2660 | 91 19 38 | 2666 |
| | Venus | W. | 83 34 11 | 2789 | 85 8 53 | 2796 | 86 43 26 | 2802 | 88 17 51 | 2809 |
| | Aldebaran | W. | 74 8 42 | 2494 | 75 50 4 | 2499 | 77 31 19 | 2504 | 79 12 27 | 2510 |
| | Pollux | W. | 30 21 19 | 2424 | 32 4 19 | 2430 | 33 47 11 | 2436 | 35 29 55 | 2442 |
| | Spica | E. | 60 32 24 | 2417 | 58 49 13 | 2423 | 57 6 11 | 2429 | 55 23 17 | 2436 |
| | Jupiter | E. | 99 39 7 | 2422 | 97 56 3 | 2428 | 96 13 8 | 2434 | 94 30 22 | 2440 |
| | Antares | E. | 106 26 27 | 2417 | 104 43 16 | 2423 | 103 0 14 | 2429 | 101 17 21 | 2436 |
| 5 | Venus | W. | 96 7 38 | 2845 | 97 41 7 | 2853 | 99 14 26 | 2861 | 100 47 35 | 2869 |
| | Aldebaran | W. | 87 36 3 | 2541 | 89 16 19 | 2548 | 90 56 25 | 2556 | 92 36 21 | 2563 |
| | Pollux | W. | 44 1 23 | 2474 | 45 43 13 | 2481 | 47 24 53 | 2487 | 49 6 24 | 2495 |
| | Spica | E. | 46 51 11 | 2470 | 45 9 15 | 2477 | 43 27 29 | 2484 | 41 45 53 | 2491 |
| | Jupiter | E. | 85 58 44 | 2473 | 84 16 53 | 2480 | 82 35 12 | 2487 | 80 53 41 | 2495 |
| | Antares | E. | 92 45 15 | 2470 | 91 3 19 | 2477 | 89 21 33 | 2484 | 87 39 57 | 2492 |
| 6 | Venus | W. | 108 30 43 | 2911 | 110 2 48 | 2920 | 111 34 41 | 2929 | 113 6 23 | 2939 |
| | Aldebaran | W. | 100 53 17 | 2605 | 102 32 5 | 2614 | 104 10 40 | 2624 | 105 49 2 | 2634 |
| | Pollux | W. | 57 31 20 | 2533 | 59 11 47 | 2542 | 60 52 2 | 2550 | 62 32 6 | 2559 |
| | Spica | E. | 33 20 32 | 2530 | 31 40 1 | 2539 | 29 59 42 | 2547 | 28 19 34 | 2556 |
| | Jupiter | E. | 72 28 49 | 2535 | 70 48 25 | 2544 | 69 8 13 | 2553 | 67 28 13 | 2561 |
| | Antares | E. | 79 14 39 | 2530 | 77 34 8 | 2539 | 75 53 49 | 2547 | 74 13 41 | 2556 |
| 7 | Pollux | W. | 70 49 27 | 2603 | 72 28 18 | 2612 | 74 6 57 | 2621 | 75 45 23 | 2631 |
| | Regulus | W. | 34 3 21 | 2610 | 35 42 2 | 2619 | 37 20 31 | 2628 | 38 58 48 | 2637 |
| | Jupiter | E. | 59 11 23 | 2610 | 57 32 41 | 2620 | 55 54 13 | 2631 | 54 16 0 | 2641 |
| | Antares | E. | 65 56 3 | 2601 | 64 17 9 | 2610 | 62 38 27 | 2620 | 60 59 59 | 2629 |
| | α Aquilæ | E. | 114 12 28 | 3595 | 112 53 48 | 3581 | 111 34 53 | 3568 | 110 15 44 | 3558 |
| 8 | Pollux | W. | 83 54 15 | 2680 | 85 31 21 | 2690 | 87 8 14 | 2701 | 88 44 53 | 2711 |
| | Regulus | W. | 47 7 7 | 2684 | 48 44 8 | 2694 | 50 20 56 | 2704 | 51 57 31 | 2714 |
| | Jupiter | E. | 46 8 37 | 2699 | 44 31 56 | 2712 | 42 55 32 | 2725 | 41 19 25 | 2738 |
| | Antares | E. | 52 50 52 | 2678 | 51 13 43 | 2688 | 49 36 47 | 2699 | 48 0 6 | 2709 |
| | α Aquilæ | E. | 103 37 48 | 3533 | 102 18 0 | 3532 | 100 58 11 | 3533 | 99 38 23 | 3535 |
| 9 | Pollux | W. | 96 44 40 | 2763 | 98 19 56 | 2774 | 99 54 58 | 2785 | 101 29 46 | 2795 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun | W. | 94° 15′ 59″ | 2628 | 95° 54′ 16″ | 2633 | 97° 32′ 26″ | 2638 | 99° 10′ 30″ | 2642 |
| | Mars | W. | 53 22 29 | 2543 | 55 2 43 | 2546 | 56 42 52 | 2551 | 58 22 55 | 2555 |
| | Venus | W. | 51 33 47 | 2682 | 53 10 51 | 2686 | 54 47 49 | 2691 | 56 24 41 | 2695 |
| | Aldebaran | W. | 40 10 3 | 2484 | 41 51 38 | 2477 | 43 33 24 | 2472 | 45 15 17 | 2467 |
| | Spica | E. | 95 23 28 | 2314 | 93 37 49 | 2318 | 91 52 16 | 2322 | 90 6 49 | 2327 |
| 2 | Sun | W. | 107 19 10 | 2668 | 108 56 33 | 2674 | 110 33 48 | 2679 | 112 10 56 | 2684 |
| | Mars | W. | 66 41 38 | 2578 | 68 21 3 | 2583 | 70 0 21 | 2588 | 71 39 32 | 2593 |
| | Venus | W. | 64 27 29 | 2719 | 66 3 43 | 2725 | 67 39 50 | 2730 | 69 15 50 | 2735 |
| | Aldebaran | W. | 53 45 47 | 2460 | 55 27 57 | 2460 | 57 10 7 | 2461 | 58 52 15 | 2463 |
| | Spica | E. | 81 21 14 | 2351 | 79 36 28 | 2355 | 77 51 49 | 2360 | 76 7 17 | 2366 |
| 3 | Sun | W. | 120 14 41 | 2714 | 121 51 2 | 2720 | 123 27 15 | 2727 | 125 3 19 | 2734 |
| | Mars | W. | 79 53 36 | 2621 | 81 32 2 | 2628 | 83 10 19 | 2634 | 84 48 28 | 2640 |
| | Venus | W. | 77 14 0 | 2764 | 78 49 15 | 2770 | 80 24 22 | 2776 | 81 59 21 | 2783 |
| | Aldebaran | W. | 67 22 11 | 2477 | 69 3 57 | 2480 | 70 45 38 | 2484 | 72 27 13 | 2489 |
| | Spica | E. | 67 26 34 | 2393 | 65 42 49 | 2398 | 63 59 12 | 2405 | 62 15 44 | 2410 |
| | Jupiter | E. | 106 32 41 | 2400 | 104 49 6 | 2405 | 103 5 39 | 2410 | 101 22 19 | 2416 |
| 4 | Sun | W. | 133 1 25 | 2769 | 134 36 34 | 2775 | 136 11 34 | 2783 | 137 46 24 | 2792 |
| | Mars | W. | 92 57 3 | 2673 | 94 34 19 | 2681 | 96 11 25 | 2688 | 97 48 21 | 2695 |
| | Venus | W. | 89 52 7 | 2816 | 91 26 14 | 2824 | 93 0 11 | 2831 | 94 33 59 | 2838 |
| | Aldebaran | W. | 80 53 27 | 2515 | 82 34 19 | 2521 | 84 15 3 | 2528 | 85 55 38 | 2535 |
| | Pollux | W. | 37 12 30 | 2448 | 38 54 57 | 2454 | 40 37 15 | 2460 | 42 19 24 | 2467 |
| | Spica | E. | 53 40 33 | 2442 | 51 57 58 | 2449 | 50 15 33 | 2455 | 48 33 17 | 2462 |
| | Jupiter | E. | 92 47 44 | 2446 | 91 5 15 | 2453 | 89 22 55 | 2460 | 87 40 45 | 2466 |
| | Antares | E. | 99 34 37 | 2442 | 97 52 2 | 2449 | 96 9 37 | 2455 | 94 27 21 | 2463 |
| 5 | Venus | W. | 102 20 34 | 2877 | 103 53 22 | 2885 | 105 26 0 | 2894 | 106 58 27 | 2902 |
| | Aldebaran | W. | 94 16 7 | 2571 | 95 55 42 | 2580 | 97 35 5 | 2588 | 99 14 17 | 2596 |
| | Pollux | W. | 50 47 44 | 2502 | 52 28 54 | 2510 | 54 9 53 | 2517 | 55 50 42 | 2525 |
| | Spica | E. | 40 4 27 | 2499 | 38 23 12 | 2507 | 36 42 8 | 2514 | 35 1 14 | 2522 |
| | Jupiter | E. | 79 12 21 | 2503 | 77 31 12 | 2510 | 75 50 13 | 2518 | 74 9 25 | 2527 |
| | Antares | E. | 85 58 32 | 2500 | 84 17 18 | 2507 | 82 36 14 | 2515 | 80 55 21 | 2522 |
| 6 | Venus | W. | 114 37 53 | 2948 | 116 9 11 | 2957 | 117 40 17 | 2967 | 119 11 11 | 2977 |
| | Aldebaran | W. | 107 27 11 | 2643 | 109 5 7 | 2654 | 110 42 48 | 2665 | 112 20 15 | 2676 |
| | Pollux | W. | 64 11 58 | 2567 | 65 51 39 | 2576 | 67 31 7 | 2585 | 69 10 23 | 2593 |
| | Spica | E. | 26 39 38 | 2564 | 24 59 54 | 2573 | 23 20 22 | 2582 | 21 41 3 | 2591 |
| | Jupiter | E. | 65 48 25 | 2571 | 64 8 50 | 2580 | 62 29 28 | 2590 | 60 50 19 | 2599 |
| | Antares | E. | 72 33 45 | 2564 | 70 54 1 | 2573 | 69 14 29 | 2583 | 67 35 10 | 2591 |
| 7 | Pollux | W. | 77 23 36 | 2641 | 79 1 36 | 2651 | 80 39 22 | 2661 | 82 16 55 | 2670 |
| | Regulus | W. | 40 36 53 | 2646 | 42 14 46 | 2655 | 43 52 26 | 2665 | 45 29 53 | 2675 |
| | Jupiter | E. | 52 38 1 | 2652 | 51 0 17 | 2663 | 49 22 48 | 2675 | 47 45 34 | 2687 |
| | Antares | E. | 59 21 43 | 2638 | 57 43 40 | 2649 | 56 5 51 | 2658 | 54 28 15 | 2668 |
| | α Aquilæ | E. | 108 56 24 | 3549 | 107 36 54 | 3543 | 106 17 17 | 3537 | 104 57 34 | 3535 |
| 8 | Pollux | W. | 90 21 18 | 2722 | 91 57 29 | 2732 | 93 33 26 | 2742 | 95 9 10 | 2753 |
| | Regulus | W. | 53 33 52 | 2724 | 55 10 0 | 2734 | 56 45 54 | 2745 | 58 21 34 | 2755 |
| | Jupiter | E. | 39 43 35 | 2752 | 38 8 4 | 2766 | 36 32 52 | 2781 | 34 57 59 | 2797 |
| | Antares | E. | 46 23 38 | 2719 | 44 47 24 | 2730 | 43 11 24 | 2741 | 41 35 38 | 2751 |
| | α Aquilæ | E. | 98 18 38 | 3539 | 96 58 57 | 3544 | 95 39 21 | 3549 | 94 19 51 | 3556 |
| 9 | Pollux | W. | 103 4 20 | 2806 | 104 38 40 | 2816 | 106 12 47 | 2827 | 107 46 40 | 2838 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Regulus | W. | 59° 57′ 1″ | 2766 | 61° 32′ 14″ | 2776 | 63° 7′ 13″ | 2786 | 64° 41′ 59″ | 2797 |
| | Jupiter | E. | 33 23 27 | 2814 | 31 49 17 | 2831 | 30 15 29 | 2849 | 28 42 5 | 2869 |
| | Antares | E. | 40 0 6 | 2761 | 38 24 47 | 2772 | 36 49 42 | 2783 | 35 14 52 | 2793 |
| | α Aquilæ | E. | 93 0 29 | 3565 | 91 41 16 | 3574 | 90 22 13 | 3584 | 89 3 21 | 3596 |
| 10 | Pollux | W. | 109 20 19 | 2848 | 110 53 45 | 2859 | 112 26 57 | 2869 | 113 59 56 | 2878 |
| | Regulus | W. | 72 32 24 | 2849 | 74 5 49 | 2859 | 75 39 0 | 2870 | 77 11 58 | 2879 |
| | Antares | E. | 27 24 4 | 2845 | 25 50 35 | 2856 | 24 17 20 | 2866 | 22 44 17 | 2877 |
| | α Aquilæ | E. | 82 32 28 | 3666 | 81 15 5 | 3684 | 79 58 1 | 3702 | 78 41 16 | 3721 |
| | Fomalhaut | E. | 108 38 53 | 3106 | 107 10 51 | 3113 | 105 42 57 | 3119 | 104 15 10 | 3125 |
| | Saturn | E. | 113 46 34 | 2879 | 112 13 48 | 2889 | 110 41 15 | 2900 | 109 8 56 | 2909 |
| 11 | Regulus | W. | 84 53 41 | 2928 | 86 25 25 | 2937 | 87 56 57 | 2946 | 89 28 18 | 2955 |
| | Spica | W. | 30 52 0 | 2924 | 32 23 48 | 2934 | 33 55 24 | 2943 | 35 26 49 | 2951 |
| | α Aquilæ | E. | 72 22 55 | 3833 | 71 8 27 | 3859 | 69 54 26 | 3887 | 68 40 53 | 3916 |
| | Fomalhaut | E. | 96 58 24 | 3163 | 95 31 30 | 3171 | 94 4 46 | 3179 | 92 38 12 | 3187 |
| | Saturn | E. | 101 30 28 | 2958 | 99 59 23 | 2967 | 98 28 29 | 2977 | 96 57 47 | 2985 |
| | α Pegasi | E. | 118 31 55 | 3276 | 117 7 15 | 3275 | 115 42 34 | 3276 | 114 17 54 | 3276 |
| 12 | Regulus | W. | 97 2 20 | 2995 | 98 32 39 | 3003 | 100 2 48 | 3010 | 101 32 48 | 3017 |
| | Spica | W. | 43 1 12 | 2992 | 44 31 35 | 3000 | 46 1 48 | 3007 | 47 31 52 | 3014 |
| | α Aquilæ | E. | 62 40 50 | 4083 | 61 30 32 | 4122 | 60 20 52 | 4164 | 59 11 52 | 4207 |
| | Fomalhaut | E. | 85 27 50 | 3230 | 84 2 16 | 3239 | 82 36 53 | 3247 | 81 11 40 | 3256 |
| | Saturn | E. | 89 26 57 | 3026 | 87 57 17 | 3034 | 86 27 46 | 3041 | 84 58 24 | 3047 |
| | α Pegasi | E. | 107 14 59 | 3287 | 105 50 32 | 3290 | 104 26 9 | 3294 | 103 1 50 | 3296 |
| | Sun | E. | 137 33 13 | 3365 | 136 10 16 | 3372 | 134 47 27 | 3379 | 133 24 47 | 3387 |
| 13 | Regulus | W. | 109 0 51 | 3046 | 110 30 7 | 3051 | 111 59 17 | 3056 | 113 28 21 | 3060 |
| | Spica | W. | 55 0 16 | 3043 | 56 29 36 | 3048 | 57 58 50 | 3052 | 59 27 59 | 3056 |
| | α Aquilæ | E. | 53 37 58 | 4472 | 52 33 41 | 4536 | 51 30 21 | 4604 | 50 28 0 | 4677 |
| | Fomalhaut | E. | 74 8 9 | 3300 | 72 43 58 | 3309 | 71 19 57 | 3319 | 69 56 7 | 3327 |
| | Saturn | E. | 77 33 30 | 3077 | 76 4 52 | 3081 | 74 36 19 | 3086 | 73 7 52 | 3090 |
| | α Pegasi | E. | 96 1 12 | 3314 | 94 37 17 | 3318 | 93 13 26 | 3321 | 91 49 39 | 3325 |
| | Sun | E. | 126 33 24 | 3418 | 125 11 28 | 3423 | 123 49 37 | 3428 | 122 27 52 | 3431 |
| 14 | Spica | W. | 66 52 40 | 3069 | 68 21 27 | 3071 | 69 50 12 | 3072 | 71 18 56 | 3073 |
| | Jupiter | W. | 28 54 53 | 3129 | 30 22 27 | 3123 | 31 50 9 | 3117 | 33 17 58 | 3113 |
| | Fomalhaut | E. | 62 59 36 | 3375 | 61 36 51 | 3386 | 60 14 18 | 3395 | 58 51 56 | 3407 |
| | Saturn | E. | 65 46 41 | 3103 | 64 18 35 | 3105 | 62 50 31 | 3106 | 61 22 29 | 3106 |
| | α Pegasi | E. | 84 51 45 | 3341 | 83 28 21 | 3345 | 82 5 1 | 3348 | 80 41 45 | 3351 |
| | Sun | E. | 115 40 7 | 3446 | 114 18 43 | 3448 | 112 57 21 | 3449 | 111 36 0 | 3450 |
| 15 | Spica | W. | 78 42 34 | 3069 | 80 11 22 | 3067 | 81 40 12 | 3065 | 83 9 5 | 3061 |
| | Jupiter | W. | 40 38 30 | 3088 | 42 6 54 | 3083 | 43 35 25 | 3078 | 45 4 2 | 3073 |
| | Antares | W. | 32 48 31 | 3069 | 34 17 18 | 3067 | 35 46 8 | 3065 | 37 15 1 | 3061 |
| | Fomalhaut | E. | 52 3 27 | 3470 | 50 42 29 | 3486 | 49 21 49 | 3502 | 48 1 27 | 3519 |
| | Saturn | E. | 54 2 15 | 3103 | 52 34 9 | 3101 | 51 6 0 | 3098 | 49 37 48 | 3095 |
| | α Pegasi | E. | 73 46 13 | 3365 | 72 23 16 | 3367 | 71 0 22 | 3370 | 69 37 31 | 3373 |
| | Sun | E. | 104 49 16 | 3446 | 103 27 51 | 3444 | 102 6 24 | 3441 | 100 44 54 | 3438 |
| 16 | Spica | W. | 90 34 41 | 3038 | 92 4 6 | 3033 | 93 33 38 | 3026 | 95 3 19 | 3019 |
| | Jupiter | W. | 52 28 53 | 3041 | 53 58 15 | 3033 | 55 27 47 | 3026 | 56 57 28 | 3018 |
| | Antares | W. | 44 40 36 | 3039 | 46 10 1 | 3033 | 47 39 33 | 3026 | 49 9 13 | 3019 |
| | Fomalhaut | E. | 41 25 8 | 3639 | 40 7 16 | 3672 | 38 49 58 | 3708 | 37 33 19 | 3748 |
| | Saturn | E. | 42 15 37 | 3072 | 40 46 53 | 3065 | 39 18 1 | 3059 | 37 49 1 | 3052 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Regulus | W. | 66° 16′ 31″ | 2807 | 67° 50′ 50″ | 2818 | 69° 24′ 55″ | 2828 | 70° 58′ 46″ | 2838 |
| | Jupiter | E. | 27 9 6 | 2891 | 25 36 35 | 2916 | 24 4 36 | 2943 | 22 33 11 | 2972 |
| | Antares | E. | 33 40 15 | 2804 | 32 5 52 | 2814 | 30 31 42 | 2825 | 28 57 46 | 2835 |
| | α Aquilæ | E. | 87 44 42 | 3608 | 86 26 16 | 3621 | 85 8 4 | 3635 | 83 50 8 | 3650 |
| 10 | Pollux | W. | 115 32 43 | 2889 | 117 5 16 | 2898 | 118 37 37 | 2908 | 120 9 46 | 2918 |
| | Regulus | W. | 78 44 44 | 2889 | 80 17 17 | 2899 | 81 49 37 | 2909 | 83 21 45 | 2918 |
| | Antares | E. | 21 11 28 | 2887 | 19 38 52 | 2896 | 18 6 28 | 2906 | 16 34 17 | 2916 |
| | α Aquilæ | E. | 77 24 51 | 3741 | 76 8 47 | 3763 | 74 53 6 | 3785 | 73 37 48 | 3809 |
| | Fomalhaut | E. | 102 47 31 | 3133 | 101 20 1 | 3139 | 99 52 39 | 3148 | 98 25 27 | 3155 |
| | Saturn | E. | 107 36 49 | 2920 | 106 4 55 | 2930 | 104 33 14 | 2939 | 103 1 45 | 2949 |
| 11 | Regulus | W. | 90 59 27 | 2963 | 92 30 26 | 2972 | 94 1 14 | 2980 | 95 31 52 | 2988 |
| | Spica | W. | 36 58 3 | 2960 | 38 29 6 | 2969 | 39 59 58 | 2977 | 41 30 40 | 2985 |
| | α Aquilæ | E. | 67 27 49 | 3945 | 66 15 15 | 3977 | 65 3 13 | 4011 | 63 51 44 | 4046 |
| | Fomalhaut | E. | 91 11 47 | 3195 | 89 45 32 | 3204 | 88 19 28 | 3213 | 86 53 34 | 3221 |
| | Saturn | E. | 95 27 16 | 2994 | 93 56 56 | 3002 | 92 26 46 | 3011 | 90 56 47 | 3018 |
| | α Pegasi | E. | 112 53 15 | 3278 | 111 28 38 | 3279 | 110 4 2 | 3282 | 108 39 29 | 3284 |
| 12 | Regulus | W. | 103 2 40 | 3023 | 104 32 24 | 3030 | 106 2 0 | 3035 | 107 31 29 | 3041 |
| | Spica | W. | 49 1 48 | 3020 | 50 31 36 | 3026 | 52 1 16 | 3032 | 53 30 49 | 3037 |
| | α Aquilæ | E. | 58 3 33 | 4254 | 56 55 58 | 4304 | 55 49 9 | 4356 | 54 43 8 | 4412 |
| | Fomalhaut | E. | 79 46 37 | 3265 | 78 21 44 | 3274 | 76 57 2 | 3282 | 75 32 30 | 3292 |
| | Saturn | E. | 83 29 10 | 3054 | 82 0 4 | 3060 | 80 31 6 | 3066 | 79 2 15 | 3071 |
| | α Pegasi | E. | 101 37 34 | 3300 | 100 13 23 | 3303 | 98 49 15 | 3306 | 97 25 11 | 3311 |
| | Sun | E. | 132 2 16 | 3393 | 130 39 52 | 3400 | 129 17 36 | 3407 | 127 55 27 | 3412 |
| 13 | Regulus | W. | 114 57 20 | 3064 | 116 26 14 | 3066 | 117 55 5 | 3069 | 119 23 52 | 3072 |
| | Spica | W. | 60 57 3 | 3060 | 62 26 2 | 3062 | 63 54 58 | 3065 | 65 23 50 | 3067 |
| | α Aquilæ | E. | 49 26 41 | 4756 | 48 26 28 | 4842 | 47 27 26 | 4933 | 46 29 38 | 5032 |
| | Fomalhaut | E. | 68 32 27 | 3337 | 67 8 58 | 3346 | 65 45 40 | 3355 | 64 22 32 | 3365 |
| | Saturn | E. | 71 39 30 | 3093 | 70 11 12 | 3096 | 68 42 58 | 3100 | 67 14 48 | 3102 |
| | α Pegasi | E. | 90 25 56 | 3328 | 89 2 17 | 3332 | 87 38 43 | 3335 | 86 15 12 | 3338 |
| | Sun | E. | 121 6 11 | 3436 | 119 44 35 | 3438 | 118 23 2 | 3442 | 117 1 33 | 3445 |
| 14 | Spica | W. | 72 47 39 | 3073 | 74 16 22 | 3073 | 75 45 5 | 3072 | 77 13 49 | 3071 |
| | Jupiter | W. | 34 45 52 | 3108 | 36 13 52 | 3103 | 37 41 58 | 3097 | 39 10 11 | 3092 |
| | Fomalhaut | E. | 57 29 47 | 3418 | 56 7 51 | 3431 | 54 46 9 | 3443 | 53 24 41 | 3455 |
| | Saturn | E. | 59 54 27 | 3106 | 58 26 25 | 3106 | 56 58 23 | 3105 | 55 30 20 | 3104 |
| | α Pegasi | E. | 79 18 32 | 3353 | 77 55 22 | 3357 | 76 32 16 | 3359 | 75 9 13 | 3362 |
| | Sun | E. | 110 14 40 | 3450 | 108 53 20 | 3450 | 107 32 0 | 3449 | 106 10 39 | 3447 |
| 15 | Spica | W. | 84 38 2 | 3058 | 86 7 3 | 3053 | 87 36 10 | 3049 | 89 5 22 | 3043 |
| | Jupiter | W. | 46 32 45 | 3067 | 48 1 35 | 3061 | 49 30 33 | 3054 | 50 59 39 | 3048 |
| | Antares | W. | 38 43 58 | 3058 | 40 12 59 | 3053 | 41 42 6 | 3049 | 43 11 18 | 3044 |
| | Fomalhaut | E. | 46 41 24 | 3539 | 45 21 43 | 3560 | 44 2 25 | 3583 | 42 43 32 | 3610 |
| | Saturn | E. | 48 9 32 | 3091 | 46 41 12 | 3087 | 45 12 46 | 3082 | 43 44 15 | 3077 |
| | α Pegasi | E. | 68 14 44 | 3376 | 66 52 0 | 3379 | 65 29 19 | 3382 | 64 6 42 | 3386 |
| | Sun | E. | 99 23 20 | 3434 | 98 1 42 | 3429 | 96 39 58 | 3424 | 95 18 9 | 3418 |
| 16 | Spica | W. | 96 33 8 | 3012 | 98 3 6 | 3004 | 99 33 14 | 2996 | 101 3 32 | 2986 |
| | Jupiter | W. | 58 27 19 | 3009 | 59 57 21 | 3001 | 61 27 33 | 2991 | 62 57 57 | 2982 |
| | Antares | W. | 50 39 2 | 3012 | 52 9 0 | 3004 | 53 39 8 | 2996 | 55 9 26 | 2986 |
| | Fomalhaut | E. | 36 17 23 | 3795 | 35 2 16 | 3849 | 33 48 4 | 3911 | 32 34 55 | 3980 |
| | Saturn | E. | 36 19 53 | 3045 | 34 50 36 | 3036 | 33 21 8 | 3028 | 31 51 30 | 3020 |

# APRIL, 1876.

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | |
| 16 | α Pegasi | E. | 62 44 9 | 3390 | 61 21 41 | 3393 | 59 59 17 | 3398 | 58 36 58 | 3403 |
| | Sun | E. | 93 56 13 | 3413 | 92 34 11 | 3406 | 91 12 1 | 3400 | 89 49 44 | 3392 |
| 17 | Spica | W. | 102 34 2 | 2977 | 104 4 43 | 2968 | 105 35 36 | 2958 | 107 6 42 | 2946 |
| | Jupiter | W. | 64 28 32 | 2972 | 65 59 20 | 2962 | 67 30 21 | 2951 | 69 1 35 | 2939 |
| | Antares | W. | 56 39 56 | 2977 | 58 10 37 | 2968 | 59 41 30 | 2958 | 61 12 36 | 2947 |
| | Fomalhaut | E. | 31 22 56 | 4062 | 30 12 17 | 4156 | 29 3 9 | 4266 | 27 55 45 | 4396 |
| | α Pegasi | E. | 51 47 8 | 3441 | 50 25 38 | 3452 | 49 4 20 | 3464 | 47 43 16 | 3480 |
| | Sun | E. | 82 55 58 | 3347 | 81 32 41 | 3336 | 80 9 11 | 3325 | 78 45 29 | 3314 |
| 18 | Jupiter | W. | 76 41 29 | 2879 | 78 14 15 | 2866 | 79 47 18 | 2852 | 81 20 39 | 2838 |
| | Antares | W. | 68 51 36 | 2888 | 70 24 10 | 2876 | 71 57 0 | 2862 | 73 30 8 | 2849 |
| | α Aquilæ | W. | 36 37 45 | 7073 | 37 13 4 | 6730 | 37 51 17 | 6427 | 38 32 16 | 6155 |
| | Sun | E. | 71 43 30 | 3251 | 70 18 21 | 3236 | 68 52 55 | 3223 | 67 27 13 | 3208 |
| 19 | Jupiter | W. | 89 11 57 | 2765 | 90 47 11 | 2750 | 92 22 45 | 2735 | 93 58 39 | 2719 |
| | Antares | W. | 81 20 17 | 2776 | 82 55 16 | 2760 | 84 30 36 | 2745 | 86 6 16 | 2729 |
| | α Aquilæ | W. | 42 34 45 | 5131 | 43 29 59 | 4975 | 44 27 14 | 4833 | 45 26 23 | 4701 |
| | Sun | E. | 60 14 13 | 3130 | 58 46 40 | 3114 | 57 18 48 | 3097 | 55 50 35 | 3081 |
| 20 | Jupiter | W. | 102 3 28 | 2638 | 103 41 31 | 2621 | 105 19 57 | 2605 | 106 58 45 | 2589 |
| | Antares | W. | 94 9 58 | 2648 | 95 47 48 | 2631 | 97 26 1 | 2614 | 99 4 37 | 2597 |
| | α Aquilæ | W. | 50 47 46 | 4175 | 51 56 36 | 4089 | 53 6 48 | 4011 | 54 18 17 | 3936 |
| | Sun | E. | 48 24 19 | 2994 | 46 53 59 | 2977 | 45 23 18 | 2960 | 43 52 15 | 2942 |
| 21 | Antares | W. | 107 23 23 | 2513 | 109 4 18 | 2497 | 110 45 36 | 2480 | 112 27 17 | 2463 |
| | α Aquilæ | W. | 60 33 7 | 3627 | 61 51 12 | 3575 | 63 10 14 | 3526 | 64 30 9 | 3480 |
| 26 | Sun | W. | 30 29 58 | 2441 | 32 12 34 | 2440 | 33 55 12 | 2440 | 35 37 50 | 2440 |
| | Pollux | E. | 44 35 2 | 2127 | 42 44 44 | 2128 | 40 54 28 | 2130 | 39 4 15 | 2132 |
| | Regulus | E. | 81 22 46 | 2126 | 79 32 26 | 2126 | 77 42 6 | 2127 | 75 51 48 | 2129 |
| 27 | Sun | W. | 44 10 34 | 2452 | 45 52 55 | 2456 | 47 35 10 | 2461 | 49 17 18 | 2466 |
| | Pollux | E. | 29 54 16 | 2152 | 28 4 36 | 2158 | 26 15 5 | 2165 | 24 25 44 | 2172 |
| | Regulus | E. | 66 41 15 | 2145 | 64 51 25 | 2149 | 63 1 41 | 2155 | 61 12 5 | 2161 |
| | Spica | E. | 120 41 48 | 2141 | 118 51 52 | 2146 | 117 2 3 | 2151 | 115 12 22 | 2157 |
| 28 | Sun | W. | 57 45 56 | 2499 | 59 27 10 | 2507 | 61 8 14 | 2515 | 62 49 6 | 2523 |
| | Mars | W. | 24 57 38 | 2453 | 26 39 58 | 2454 | 28 22 16 | 2457 | 30 4 30 | 2460 |
| | Regulus | E. | 52 6 24 | 2194 | 50 17 47 | 2202 | 48 29 22 | 2210 | 46 41 9 | 2218 |
| | Spica | E. | 106 6 9 | 2189 | 104 17 25 | 2196 | 102 28 52 | 2204 | 100 40 30 | 2213 |
| 29 | Sun | W. | 71 10 24 | 2570 | 72 50 0 | 2580 | 74 29 23 | 2590 | 76 8 32 | 2600 |
| | Mars | W. | 38 33 55 | 2492 | 40 15 19 | 2500 | 41 56 32 | 2509 | 43 37 33 | 2517 |
| | Venus | W. | 25 45 34 | 2586 | 27 24 48 | 2595 | 29 3 50 | 2603 | 30 42 41 | 2612 |
| | Regulus | E. | 37 43 21 | 2264 | 35 56 29 | 2274 | 34 9 52 | 2285 | 32 23 31 | 2296 |
| | Spica | E. | 91 41 51 | 2256 | 89 54 47 | 2265 | 88 7 56 | 2275 | 86 21 20 | 2285 |
| | Jupiter | E. | 128 29 28 | 2256 | 126 42 24 | 2263 | 124 55 30 | 2271 | 123 8 48 | 2279 |
| 30 | Sun | W. | 84 20 43 | 2654 | 85 58 25 | 2665 | 87 35 52 | 2676 | 89 13 4 | 2687 |
| | Mars | W. | 51 59 33 | 2564 | 53 39 17 | 2574 | 55 18 47 | 2584 | 56 58 4 | 2595 |
| | Venus | W. | 38 53 40 | 2662 | 40 31 11 | 2672 | 42 8 28 | 2683 | 43 45 31 | 2693 |
| | Spica | E. | 77 31 55 | 2335 | 75 46 46 | 2345 | 74 1 52 | 2355 | 72 17 13 | 2366 |
| | Jupiter | E. | 114 18 27 | 2324 | 112 33 3 | 2333 | 110 47 52 | 2343 | 109 2 55 | 2353 |
| | Antares | E. | 123 26 6 | 2335 | 121 40 57 | 2345 | 119 56 3 | 2355 | 118 11 24 | 2366 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 16 | α Pegasi | E. | 57° 14′ 45″ | 3409 | 55° 52′ 39″ | 3415 | 54° 30′ 40″ | 3423 | 53° 8′ 49″ | 3431 |
| | Sun | E. | 88 27 18 | 3384 | 87 4 43 | 3376 | 85 41 59 | 3366 | 84 19 4 | 3357 |
| 17 | Spica | W. | 108 38 2 | 2936 | 110 9 35 | 2924 | 111 41 23 | 2913 | 113 13 26 | 2901 |
| | Jupiter | W. | 70 33 4 | 2928 | 72 4 47 | 2916 | 73 36 45 | 2904 | 75 8 59 | 2891 |
| | Antares | W. | 62 43 55 | 2936 | 64 15 28 | 2924 | 65 47 16 | 2913 | 67 19 18 | 2901 |
| | Fomalhaut | E. | 26 50 20 | 4549 | 25 47 11 | 4732 | 24 46 38 | 4950 | 23 49 3 | 5213 |
| | α Pegasi | E. | 46 22 29 | 3497 | 45 2 1 | 3515 | 43 41 54 | 3538 | 42 22 12 | 3564 |
| | Sun | E. | 77 21 34 | 3302 | 75 57 25 | 3290 | 74 33 2 | 3277 | 73 8 24 | 3264 |
| 18 | Jupiter | W. | 82 54 17 | 2824 | 84 28 14 | 2810 | 86 2 29 | 2795 | 87 37 3 | 2780 |
| | Antares | W. | 75 3 33 | 2835 | 76 37 16 | 2821 | 78 11 17 | 2806 | 79 45 37 | 2791 |
| | α Aquilæ | W. | 39 15 54 | 5908 | 40 2 5 | 5686 | 40 50 41 | 5483 | 41 41 37 | 5299 |
| | Sun | E. | 66 1 13 | 3193 | 64 34 56 | 3178 | 63 8 20 | 3163 | 61 41 26 | 3147 |
| 19 | Jupiter | W. | 95 34 54 | 2703 | 97 11 30 | 2687 | 98 48 28 | 2671 | 100 25 47 | 2655 |
| | Antares | W. | 87 42 17 | 2713 | 89 18 40 | 2697 | 90 55 24 | 2681 | 92 32 30 | 2664 |
| | α Aquilæ | W. | 46 27 22 | 4579 | 47 30 5 | 4467 | 48 34 26 | 4363 | 49 40 21 | 4265 |
| | Sun | E. | 54 22 2 | 3064 | 52 53 8 | 3047 | 51 23 53 | 3030 | 49 54 17 | 3012 |
| 20 | Jupiter | W. | 108 37 55 | 2572 | 110 17 28 | 2556 | 111 57 23 | 2540 | 113 37 41 | 2524 |
| | Antares | W. | 100 43 36 | 2580 | 102 22 58 | 2564 | 104 2 43 | 2547 | 105 42 51 | 2530 |
| | α Aquilæ | W. | 55 31 0 | 3866 | 56 44 54 | 3801 | 57 59 55 | 3740 | 59 16 0 | 3681 |
| | Sun | E. | 42 20 49 | 2924 | 40 49 1 | 2908 | 39 16 52 | 2891 | 37 44 21 | 2873 |
| 21 | Antares | W. | 114 9 22 | 2447 | 115 51 50 | 2431 | 117 34 40 | 2415 | 119 17 53 | 2400 |
| | α Aquilæ | W. | 65 50 55 | 3438 | 67 12 29 | 3396 | 68 34 50 | 3358 | 69 57 55 | 3321 |
| 26 | Sun | W. | 37 20 28 | 2441 | 39 3 4 | 2443 | 40 45 38 | 2445 | 42 28 8 | 2448 |
| | Pollux | E. | 37 14 5 | 2135 | 35 24 0 | 2138 | 33 33 59 | 2142 | 31 44 4 | 2147 |
| | Regulus | E. | 74 1 33 | 2131 | 72 11 21 | 2134 | 70 21 14 | 2137 | 68 31 12 | 2141 |
| 27 | Sun | W. | 50 59 19 | 2472 | 52 41 12 | 2478 | 54 22 56 | 2485 | 56 4 31 | 2492 |
| | Pollux | E. | 22 36 34 | 2180 | 20 47 36 | 2190 | 18 58 53 | 2201 | 17 10 26 | 2214 |
| | Regulus | E. | 59 22 38 | 2167 | 57 33 20 | 2172 | 55 44 11 | 2179 | 53 55 12 | 2186 |
| | Spica | E. | 113 22 49 | 2162 | 111 33 24 | 2168 | 109 44 9 | 2175 | 107 55 4 | 2182 |
| 28 | Sun | W. | 64 29 47 | 2533 | 66 10 15 | 2541 | 67 50 31 | 2551 | 69 30 34 | 2560 |
| | Mars | W. | 31 46 39 | 2465 | 33 28 41 | 2471 | 35 10 35 | 2477 | 36 52 20 | 2484 |
| | Regulus | E. | 44 53 9 | 2227 | 43 5 22 | 2236 | 41 17 48 | 2245 | 39 30 27 | 2255 |
| | Spica | E. | 98 52 21 | 2221 | 97 4 24 | 2229 | 95 16 40 | 2238 | 93 29 9 | 2247 |
| 29 | Sun | W. | 77 47 27 | 2610 | 79 26 8 | 2621 | 81 4 34 | 2632 | 82 42 46 | 2643 |
| | Mars | W. | 45 18 23 | 2526 | 46 59 0 | 2535 | 48 39 24 | 2545 | 50 19 35 | 2554 |
| | Venus | W. | 32 21 19 | 2622 | 33 59 44 | 2632 | 35 37 56 | 2641 | 37 15 55 | 2652 |
| | Regulus | E. | 30 37 25 | 2307 | 28 51 35 | 2318 | 27 6 2 | 2330 | 25 20 46 | 2342 |
| | Spica | E. | 84 34 58 | 2294 | 82 48 50 | 2304 | 81 2 57 | 2315 | 79 17 19 | 2324 |
| | Jupiter | E. | 121 22 18 | 2288 | 119 36 1 | 2296 | 117 49 56 | 2306 | 116 4 5 | 2315 |
| 30 | Sun | W. | 90 50 2 | 2698 | 92 26 45 | 2710 | 94 3 12 | 2721 | 95 39 24 | 2732 |
| | Mars | W. | 58 37 6 | 2605 | 60 15 54 | 2615 | 61 54 28 | 2626 | 63 32 48 | 2637 |
| | Venus | W. | 45 22 20 | 2704 | 46 58 55 | 2715 | 48 35 15 | 2725 | 50 11 22 | 2736 |
| | Spica | E. | 70 32 49 | 2376 | 68 48 40 | 2386 | 67 4 45 | 2397 | 65 21 6 | 2407 |
| | Jupiter | E. | 107 18 13 | 2363 | 105 33 45 | 2373 | 103 49 31 | 2382 | 102 5 31 | 2393 |
| | Antares | E. | 116 27 0 | 2376 | 114 42 51 | 2387 | 112 58 57 | 2397 | 111 15 18 | 2407 |

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be subtracted from Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | Semi-diameter. | | | |
| | | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Mon. | 1 | 2 35 56.17 | 9.553 | N.15 16 9.8 | +44.98 | 15 54.06 | 66.11 | 3 4.58 | 0.302 |
| Tues. | 2 | 2 39 45.72 | 9.575 | 15 34 1.7 | 44.34 | 15 53.83 | 66.19 | 3 11.57 | 0.280 |
| Wed. | 3 | 2 43 35.81 | 9.597 | 15 51 38.1 | 43.69 | 15 53.60 | 66.27 | 3 18.02 | 0.258 |
| Thur. | 4 | 2 47 26.45 | 9.620 | 16 8 58.7 | 43.02 | 15 53.38 | 66.35 | 3 23.93 | 0.235 |
| Frid. | 5 | 2 51 17.61 | 9.643 | 16 26 3.2 | 42.35 | 15 53.16 | 66.43 | 3 29.30 | 0.212 |
| Sat. | 6 | 2 55 9.32 | 9.666 | 16 42 51.4 | 41.66 | 15 52.94 | 66.51 | 3 34.13 | 0.189 |
| *Sun.* | 7 | 2 59 1.60 | 9.690 | 16 59 22.9 | 40.96 | 15 52.72 | 66.59 | 3 38.39 | 0.166 |
| Mon. | 8 | 3 2 54.46 | 9.714 | 17 15 37.4 | 40.25 | 15 52.50 | 66.67 | 3 42.08 | 0.142 |
| Tues. | 9 | 3 6 47.89 | 9.738 | 17 31 34.7 | 39.53 | 15 52.28 | 66.75 | 3 45.20 | 0.118 |
| Wed. | 10 | 3 10 41.90 | 9.763 | 17 47 14.6 | 38.79 | 15 52.07 | 66.84 | 3 47.74 | 0.093 |
| Thur. | 11 | 3 14 36.49 | 9.787 | 18 2 36.6 | 38.05 | 15 51.86 | 66.92 | 3 49.69 | 0.069 |
| Frid. | 12 | 3 18 31.66 | 9.812 | 18 17 40.6 | 37.29 | 15 51.65 | 67.01 | 3 51.06 | 0.044 |
| Sat. | 13 | 3 22 27.43 | 9.836 | 18 32 26.4 | 36.52 | 15 51.44 | 67.09 | 3 51.86 | -0.020 |
| *Sun.* | 14 | 3 26 23.80 | 9.860 | 18 46 53.5 | 35.73 | 15 51.24 | 67.17 | 3 52.06 | +0.004 |
| Mon. | 15 | 3 30 20.75 | 9.884 | 19 1 1.7 | 34.94 | 15 51.04 | 67.25 | 3 51.67 | 0.028 |
| Tues. | 16 | 3 34 18.28 | 9.909 | 19 14 50.7 | 34.13 | 15 50.84 | 67.33 | 3 50.70 | 0.052 |
| Wed. | 17 | 3 38 16.39 | 9.934 | 19 28 20.3 | 33.32 | 15 50.64 | 67 41 | 3 49.14 | 0.077 |
| Thur. | 18 | 3 42 15.08 | 9.957 | 19 41 30.3 | 32.49 | 15 50.45 | 67.49 | 3 47.01 | 0.101 |
| Frid. | 19 | 3 46 14.35 | 9.981 | 19 54 20.1 | 31.65 | 15 50.26 | 67.57 | 3 44.31 | 0.125 |
| Sat. | 20 | 3 50 14.19 | 10.004 | 20 6 49.7 | 30.80 | 15 50.07 | 67.64 | 3 41.04 | 0.148 |
| *Sun.* | 21 | 3 54 14.58 | 10.026 | 20 18 58.7 | 29.93 | 15 49.89 | 67.72 | 3 37.21 | 0.170 |
| Mon. | 22 | 3 58 15.51 | 10.049 | 20 30 46.8 | 29.06 | 15 49.72 | 67.79 | 3 32.85 | 0.192 |
| Tues. | 23 | 4 2 16.96 | 10.070 | 20 42 14.0 | 28.18 | 15 49.55 | 67.87 | 3 27.98 | 0.214 |
| Wed. | 24 | 4 6 18.93 | 10.091 | 20 53 19.8 | 27.29 | 15 49.38 | 67.94 | 3 22.59 | 0.235 |
| Thur. | 25 | 4 10 21.41 | 10.111 | 21 4 3.9 | 26.39 | 15 49.22 | 68.01 | 3 16.69 | 0.256 |
| Frid. | 26 | 4 14 24.36 | 10.131 | 21 14 26.2 | 25.47 | 15 49.07 | 68.08 | 3 10.30 | 0 276 |
| Sat. | 27 | 4 18 27.78 | 10.151 | 21 24 26.7 | 24.54 | 15 48.92 | 68.15 | 3 3.44 | 0.295 |
| *Sun.* | 28 | 4 22 31.66 | 10.170 | 21 34 4.7 | 23.61 | 15 48.77 | 68.21 | 2 56.14 | 0.313 |
| Mon. | 29 | 4 26 35.99 | 10.188 | 21 43 20.2 | 22.67 | 15 48.63 | 68.27 | 2 48.41 | 0.331 |
| Tues. | 30 | 4 30 40.73 | 10.206 | 21 52 13.1 | 21.73 | 15 48.49 | 68.33 | 2 40.25 | 0.348 |
| Wed. | 31 | 4 34 45.87 | 10.223 | 22 0 43.3 | 20.77 | 15 48.36 | 68.39 | 2 31.69 | 0.365 |
| Thur. | 32 | 4 38 51.41 | 10.239 | N.22 8 50.4 | +19.81 | 15 48.23 | 68.45 | 2 22.74 | 0.381 |

**Note.—Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.**

**+ prefixed to the hourly change of declination, indicates that north declinations are increasing.**

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Equation of Time, *to be added to Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Mon. | 1 | 2 35 56.66 | 9.554 | N.15 16 12.2 | +44.98 | 3 4.60 | 0.302 | 2 39 1.26 |
| Tues. | 2 | 2 39 46.23 | 9.576 | 15 34 4.1 | 44.34 | 3 11.59 | 0.280 | 2 42 57.82 |
| Wed. | 3 | 2 43 36.34 | 9.598 | 15 51 40.7 | 43.69 | 3 18.03 | 0.258 | 2 46 54.37 |
| Thur. | 4 | 2 47 26.99 | 9.621 | 16 9 1.2 | 43.02 | 3 23.94 | 0.235 | 2 50 50.93 |
| Frid. | 5 | 2 51 18.17 | 9.644 | 16 26 5.7 | 42.35 | 3 29.31 | 0.212 | 2 54 47.48 |
| Sat. | 6 | 2 55 9.90 | 9.667 | 16 42 53.8 | 41.66 | 3 34.14 | 0.189 | 2 58 44.04 |
| *Sun.* | 7 | 2 59 2.19 | 9.690 | 16 59 25.4 | 40.96 | 3 38.40 | 0.166 | 3 2 40.59 |
| Mon. | 8 | 3 2 55.06 | 9.714 | 17 15 39.9 | 40.25 | 3 42.09 | 0.142 | 3 6 37.15 |
| Tues. | 9 | 3 6 48.50 | 9.738 | 17 31 37.2 | 39.53 | 3 45.21 | 0.118 | 3 10 33.71 |
| Wed. | 10 | 3 10 42.52 | 9.763 | 17 47 17.0 | 38.79 | 3 47.75 | 0.093 | 3 14 30.27 |
| Thur. | 11 | 3 14 37.12 | 9.787 | 18 2 39.0 | 38.05 | 3 49.70 | 0.069 | 3 18 26.82 |
| Frid. | 12 | 3 18 32.30 | 9.812 | 18 17 43.0 | 37.29 | 3 51.08 | 0.044 | 3 22 23.38 |
| Sat. | 13 | 3 22 28.07 | 9.836 | 18 32 28.8 | 36.52 | 3 51.86 | −0.020 | 3 26 19.93 |
| *Sun.* | 14 | 3 26 24.43 | 9.860 | 18 46 55.8 | 35.73 | 3 52.06 | +0.004 | 3 30 16.49 |
| Mon. | 15 | 3 30 21.38 | 9.884 | 19 1 4.0 | 34.94 | 3 51.67 | 0.028 | 3 34 13.05 |
| Tues. | 16 | 3 34 18.91 | 9.909 | 19 14 52.9 | 34.13 | 3 50.70 | 0.052 | 3 38 9.61 |
| Wed. | 17 | 3 38 17.02 | 9.934 | 19 28 22.4 | 33.32 | 3 49.14 | 0.077 | 3 42 6.16 |
| Thur. | 18 | 3 42 15.71 | 9.957 | 19 41 32.3 | 32.49 | 3 47.01 | 0.101 | 3 46 2.72 |
| Frid. | 19 | 3 46 14.98 | 9.981 | 19 54 22.1 | 31.65 | 3 44.30 | 0.125 | 3 49 59.28 |
| Sat. | 20 | 3 50 14.81 | 10.004 | 20 6 51.6 | 30.80 | 3 41.03 | 0.148 | 3 53 55.84 |
| *Sun.* | 21 | 3 54 15.19 | 10.026 | 20 19 0.6 | 29.93 | 3 37.20 | 0.170 | 3 57 52.39 |
| Mon. | 22 | 3 58 16.10 | 10.048 | 20 30 48.6 | 29.06 | 3 32.85 | 0.192 | 4 1 48.95 |
| Tues. | 23 | 4 2 17.54 | 10.069 | 20 42 15.6 | 28.18 | 3 27.97 | 0.214 | 4 5 45.51 |
| Wed. | 24 | 4 6 19.50 | 10.090 | 20 53 21.3 | 27.29 | 3 22.57 | 0.235 | 4 9 42.07 |
| Thur. | 25 | 4 10 21.96 | 10.110 | 21 4 5.4 | 26.39 | 3 16.67 | 0.256 | 4 13 38.63 |
| Frid. | 26 | 4 14 24.90 | 10.130 | 21 14 27.6 | 25.47 | 3 10.29 | 0.276 | 4 17 35.19 |
| Sat. | 27 | 4 18 28.31 | 10.150 | 21 24 27.9 | 24.54 | 3 3.43 | 0.295 | 4 21 31.74 |
| *Sun.* | 28 | 4 22 32.17 | 10.169 | 21 34 5.9 | 23.61 | 2 56.13 | 0.313 | 4 25 28.30 |
| Mon. | 29 | 4 26 36.47 | 10.187 | 21 43 21.2 | 22.67 | 2 48.39 | 0.331 | 4 29 24.86 |
| Tues. | 30 | 4 30 41.19 | 10.205 | 21 52 14.1 | 21.73 | 2 40.23 | 0.348 | 4 33 21.42 |
| Wed. | 31 | 4 34 46.31 | 10.222 | 22 0 44.2 | 20.77 | 2 31.67 | 0.365 | 4 37 17.98 |
| Thur. | 32 | 4 38 51.82 | 10.238 | N.22 8 51.2 | +19.81 | 2 22.72 | 0.381 | 4 41 14.54 |

**Note.**—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

Diff. for 1 hour. +9ˢ.8565

## AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S *True* LONGITUDE. λ | THE SUN'S *True* LONGITUDE. λ′ | THE SUN'S Diff. for 1 hour. | THE SUN'S LATITUDE. | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 122 | 41 25 39.7 | 25 23.4 | 145.38 | +0.62 | 0.0036006 | +43.3 | 21 17 28.89 |
| 2 | 123 | 42 23 48.1 | 23 31.7 | 145.30 | 0.52 | .0037041 | 42.9 | 21 13 32.98 |
| 3 | 124 | 43 21 54.6 | 21 38.0 | 145.22 | 0.39 | .0038068 | 42.4 | 21 9 37.07 |
| 4 | 125 | 44 19 59.2 | 19 42.4 | 145.15 | 0.26 | .0039087 | 42.2 | 21 5 41.17 |
| 5 | 126 | 45 18 1.9 | 17 44.9 | 145.07 | 0.13 | .0040098 | 41.8 | 21 1 45.26 |
| 6 | 127 | 46 16 2.7 | 15 45.6 | 145.00 | +0.01 | .0041101 | 41.5 | 20 57 49.35 |
| 7 | 128 | 47 14 1.8 | 13 44.6 | 144.93 | −0.12 | .0042098 | 41.2 | 20 53 53.43 |
| 8 | 129 | 48 11 59.3 | 11 41.9 | 144.86 | 0.23 | .0043087 | 40.9 | 20 49 57.52 |
| 9 | 130 | 49 9 55.2 | 9 37.6 | 144.79 | 0.30 | .0044069 | 40.6 | 20 46 1.61 |
| 10 | 131 | 50 7 49.6 | 7 31.8 | 144.73 | 0.35 | .0045044 | 40.3 | 20 42 5.70 |
| 11 | 132 | 51 5 42.5 | 5 24.6 | 144.67 | 0.35 | .0046011 | 40.0 | 20 38 9.78 |
| 12 | 133 | 52 3 34.0 | 3 16.0 | 144.62 | 0.34 | .0046969 | 39.6 | 20 34 13.87 |
| 13 | 134 | 53 1 24.2 | 1 6.0 | 144.57 | 0.29 | .0047918 | 39.2 | 20 30 17.96 |
| 14 | 135 | 53 59 13.2 | 58 54.8 | 144.52 | 0.23 | .0048857 | 38.8 | 20 26 22.05 |
| 15 | 136 | 54 57 1.1 | 56 42.5 | 144.47 | 0.14 | .0049783 | 38.3 | 20 22 26.13 |
| 16 | 137 | 55 54 47.9 | 24 29.2 | 144.43 | −0.02 | .0050695 | 38.7 | 20 18 30.22 |
| 17 | 138 | 56 52 33.5 | 52 14.7 | 144.38 | +0.11 | .0051591 | 38.0 | 20 14 34.31 |
| 18 | 139 | 57 50 18.0 | 49 59.0 | 144.34 | 0.24 | .0052472 | 36.3 | 20 10 38.40 |
| 19 | 140 | 58 48 1.4 | 47 42.2 | 144.29 | 0.38 | .0053332 | 35.5 | 20 6 42.48 |
| 20 | 141 | 59 45 43.7 | 45 24.3 | 144.24 | 0.49 | .0054173 | 34.6 | 20 2 46.57 |
| 21 | 142 | 60 43 24.9 | 43 5.3 | 144.19 | 0.60 | .0054995 | 33.7 | 19 58 50.66 |
| 22 | 143 | 61 41 4.8 | 40 45.1 | 144.14 | 0.69 | .0055796 | 32.8 | 19 54 54.75 |
| 23 | 144 | 62 38 43.6 | 38 23.7 | 144.09 | 0.73 | .0056573 | 31.8 | 19 50 58.84 |
| 24 | 145 | 63 36 21.2 | 36 1.1 | 144.04 | 0.79 | .0057326 | 30.9 | 19 47 2.93 |
| 25 | 146 | 64 33 57.5 | 33 37.2 | 143.99 | 0.78 | .0058057 | 30.0 | 19 43 7.02 |
| 26 | 147 | 65 31 32.5 | 31 12.1 | 143.93 | 0.75 | .0058767 | 29.1 | 19 39 11.11 |
| 27 | 148 | 66 29 6.2 | 28 45.6 | 143.88 | 0.69 | .0059454 | 28.2 | 19 35 15.19 |
| 28 | 149 | 67 26 38.6 | 26 17.8 | 143.83 | 0.62 | .0060121 | 27.4 | 19 31 19.28 |
| 29 | 150 | 68 24 9.7 | 23 48.7 | 413.77 | 0.50 | .0060768 | 26.5 | 19 27 23.37 |
| 30 | 151 | 69 21 39.4 | 21 18.2 | 143.71 | 0.38 | .0061395 | 25.7 | 19 23 27.46 |
| 31 | 152 | 70 19 7.8 | 18 46.5 | 143.66 | 0.25 | .0062003 | 25.0 | 19 19 31.54 |
| 32 | 153 | 71 16 35.0 | 16 13.5 | 143.62 | +0.11 | 0.0062594 | +24.3 | 19 15 35.63 |

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
—9s.8296

## GREENWICH MEAN TIME.

### THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | MERIDIAN PASSAGE. | | AGE. |
|---|---|---|---|---|---|---|---|---|---|
| | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. | | Diff. for 1 hour. | Noon. |
| | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 15 57.5 | 15 52.8 | 58 27.5 | −1.43 | 58 10.3 | −1.44 | 7 4.3 | 2.09 | 7.2 |
| 2 | 15 48.1 | 15 43.4 | 57 53.0 | 1.43 | 57 35.9 | 1.42 | 7 52.4 | 1.93 | 8.2 |
| 3 | 15 38.8 | 15 34.3 | 57 19.0 | 1.40 | 57 2.4 | 1.37 | 8 37.5 | 1.83 | 9.2 |
| 4 | 15 29.9 | 15 25.6 | 56 46.2 | 1.33 | 56 30.5 | 1.29 | 9 20.8 | 1.78 | 10.2 |
| 5 | 15 21.5 | 15 17.5 | 56 15.3 | 1.25 | 56 0.5 | 1.21 | 10 3.6 | 1.79 | 11.2 |
| 6 | 15 13.6 | 15 9.9 | 55 46.3 | 1.16 | 55 32.6 | 1.11 | 10 47.1 | 1.84 | 12.2 |
| 7 | 15 6.4 | 15 3.0 | 55 19.6 | 1.06 | 55 7.2 | 1.00 | 11 32.2 | 1.92 | 13.2 |
| 8 | 14 59.8 | 14 56.9 | 54 55.6 | 0.94 | 54 44.8 | 0.86 | 12 19.4 | 2.02 | 14.2 |
| 9 | 14 54.2 | 14 51.9 | 54 35.0 | 0.77 | 54 26.3 | 0.67 | 13 8.9 | 2.10 | 15.2 |
| 10 | 14 49.8 | 14 48.2 | 54 18.9 | 0.56 | 54 12.8 | 0.45 | 14 0.1 | 2.15 | 16.2 |
| 11 | 14 46.9 | 14 46.2 | 54 8.2 | −0.31 | 54 5.4 | −0.16 | 14 51.9 | 2.15 | 17.2 |
| 12 | 14 45.9 | 14 46.2 | 54 4.5 | +0.01 | 54 5.6 | +0.17 | 15 43.1 | 2.10 | 18.2 |
| 13 | 14 47.1 | 14 48.5 | 54 8.7 | 0.35 | 54 14.1 | 0.55 | 16 32.6 | 2.01 | 19.2 |
| 14 | 14 50.6 | 14 53.4 | 54 21.8 | 0.75 | 54 32.0 | 0.95 | 17 19.9 | 1.92 | 20.2 |
| 15 | 14 56.8 | 15 0.8 | 54 44.5 | 1.14 | 54 59.4 | 1.34 | 18 5.1 | 1.84 | 21.2 |
| 16 | 15 5.5 | 15 10.9 | 55 16.7 | 1.55 | 55 36.4 | 1.73 | 18 48.7 | 1.79 | 22.2 |
| 17 | 15 16.9 | 15 23.3 | 55 58.2 | 1.90 | 56 21.9 | 2.05 | 19 31.8 | 1.80 | 23.2 |
| 18 | 15 30.2 | 15 37.5 | 56 47.3 | 2.18 | 57 14.1 | 2.27 | 20 15.4 | 1.85 | 24.2 |
| 19 | 15 45.0 | 15 52.7 | 57 41.7 | 2.33 | 58 9.8 | 2.35 | 21 0.9 | 1.96 | 25.2 |
| 20 | 16 0.3 | 16 7.7 | 58 37.8 | 2.31 | 59 4.9 | 2.21 | 21 49.9 | 2.13 | 26.2 |
| 21 | 16 14.7 | 16 21.1 | 59 30.6 | 2.06 | 59 54.2 | 1.86 | 22 43.7 | 2.36 | 27.2 |
| 22 | 16 26.8 | 16 31.5 | 60 15.1 | 1.60 | 60 32.5 | 1.30 | 23 43.3 | 2.61 | 28.2 |
| 23 | 16 35.2 | 16 37.8 | 60 46.1 | +0.96 | 60 55.4 | +0.60 | 6 | | 29.2 |
| 24 | 16 39.2 | 16 39.3 | 61 0.4 | −0.23 | 61 0.8 | −0.15 | 0 48.0 | 2.78 | 0.9 |
| 25 | 16 38.2 | 16 36.0 | 60 56.8 | 0.51 | 60 48.6 | 0.85 | 1 55.4 | 2.80 | 1.9 |
| 26 | 16 32.7 | 16 28.5 | 60 36.6 | 1.14 | 60 21.3 | 1.40 | 3 1.7 | 2.68 | 2.9 |
| 27 | 16 23.5 | 16 18.0 | 60 3.1 | 1.62 | 59 42.7 | 1.78 | 4 3.4 | 2.45 | 3.9 |
| 28 | 16 12.0 | 16 5.7 | 59 20.7 | 1.89 | 58 57.6 | 1.95 | 4 59.3 | 2.21 | 4.9 |
| 29 | 15 59.3 | 15 52.8 | 58 34.0 | 1.98 | 58 10.3 | 1.97 | 5 49.9 | 2.01 | 5.9 |
| 30 | 15 46.4 | 15 40.2 | 57 46.9 | 1.93 | 57 24.1 | 1.87 | 6 36.3 | 1.87 | 6.9 |
| 31 | 15 34.3 | 15 28.6 | 57 2.2 | 1.78 | 56 41.3 | 1.70 | 7 20.1 | 1.79 | 7.9 |
| 32 | 15 23.2 | 15 18.1 | 56 21.5 | −1.60 | 56 2.9 | −1.49 | 8 2.8 | 1.77 | 8.9 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### MONDAY 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 9 28 47.75 | 2.2369 | N.18 21 48.8 | 13.089 |
| 1 | 9 31 1.74 | 2.2294 | 18 8 40.8 | 13.176 |
| 2 | 9 33 15.28 | 2.2220 | 17 55 27.7 | 13.260 |
| 3 | 9 35 28.38 | 2.2148 | 17 42 9.6 | 13.343 |
| 4 | 9 37 41.05 | 2.2076 | 17 28 46.5 | 13.425 |
| 5 | 9 39 53.29 | 2.2004 | 17 15 18.6 | 13.504 |
| 6 | 9 42 5.10 | 2.1933 | 17 1 46.0 | 13.582 |
| 7 | 9 44 16.48 | 2.1862 | 16 48 8.7 | 13.659 |
| 8 | 9 46 27.44 | 2.1793 | 16 34 26.9 | 13.734 |
| 9 | 9 48 37.99 | 2.1724 | 16 20 40.6 | 13.807 |
| 10 | 9 50 48.13 | 2.1656 | 16 6 50.0 | 13.878 |
| 11 | 9 52 57.86 | 2.1588 | 15 52 55.2 | 13.948 |
| 12 | 9 55 7.19 | 2.1522 | 15 38 56.2 | 14.017 |
| 13 | 9 57 16.13 | 2.1457 | 15 24 53.2 | 14.083 |
| 14 | 9 59 24.67 | 2.1391 | 15 10 46.2 | 14.149 |
| 15 | 10 1 32.82 | 2.1327 | 14 56 35.3 | 14.213 |
| 16 | 10 3 40.59 | 2.1263 | 14 42 20.6 | 14.275 |
| 17 | 10 5 47.98 | 2.1201 | 14 28 2.3 | 14.335 |
| 18 | 10 7 55.00 | 2.1139 | 14 13 40.4 | 14.394 |
| 19 | 10 10 1.65 | 2.1078 | 13 59 15.0 | 14.452 |
| 20 | 10 12 7.94 | 2.1017 | 13 44 46.2 | 14.508 |
| 21 | 10 14 13.86 | 2.0957 | 13 30 14.1 | 14.563 |
| 22 | 10 16 19.43 | 2.0899 | 13 15 38.7 | 14.616 |
| 23 | 10 18 24.65 | 2.0842 | N.13 1 0.2 | 14.667 |

### TUESDAY 2.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 10 20 29.53 | 2.0786 | N.12 46 18.7 | 14.717 |
| 1 | 10 22 34.08 | 2.0730 | 12 31 34.2 | 14.766 |
| 2 | 10 24 38.29 | 2.0673 | 12 16 46.8 | 14.813 |
| 3 | 10 26 42.16 | 2.0618 | 12 1 56.6 | 14.859 |
| 4 | 10 28 45.71 | 2.0565 | 11 47 3.7 | 14.903 |
| 5 | 10 30 48.94 | 2.0512 | 11 32 8.2 | 14.946 |
| 6 | 10 32 51.86 | 2.0461 | 11 17 10.2 | 14.988 |
| 7 | 10 34 54.47 | 2.0410 | 11 2 9.7 | 15.028 |
| 8 | 10 36 56.78 | 2.0361 | 10 47 6.8 | 15.067 |
| 9 | 10 38 58.80 | 2.0312 | 10 32 1.7 | 15.104 |
| 10 | 10 41 0.53 | 2.0263 | 10 16 54.4 | 15.140 |
| 11 | 10 43 1.96 | 2.0215 | 10 1 44.9 | 15.176 |
| 12 | 10 45 3.11 | 2.0168 | 9 46 33.3 | 15.209 |
| 13 | 10 47 3.98 | 2.0123 | 9 31 19.8 | 15.241 |
| 14 | 10 49 4.59 | 2.0079 | 9 16 4.4 | 15.272 |
| 15 | 10 51 4.93 | 2.0035 | 9 0 47.1 | 15.302 |
| 16 | 10 53 5.01 | 1.9992 | 8 45 28.1 | 15.330 |
| 17 | 10 55 4.83 | 1.9950 | 8 30 7.5 | 15.357 |
| 18 | 10 57 4.41 | 1.9910 | 8 14 45.3 | 15.382 |
| 19 | 10 59 3.75 | 1.9869 | 7 59 21.6 | 15.407 |
| 20 | 11 1 2.84 | 1.9828 | 7 43 56.4 | 15.431 |
| 21 | 11 3 1.69 | 1.9789 | 7 28 29.9 | 15.453 |
| 22 | 11 5 0.31 | 1.9752 | 7 13 2.1 | 15.473 |
| 23 | 11 6 58.72 | 1.9717 | 6 57 33.1 | 15.492 |
| 24 | 11 8 56.92 | 1.9682 | N. 6 42 3.0 | 15.511 |

### WEDNESDAY 3.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 11 8 56.92 | 1.9682 | N. 6 42 3.0 | 15.511 |
| 1 | 11 10 54.90 | 1.9646 | 6 26 31.8 | 15.528 |
| 2 | 11 12 52.67 | 1.9611 | 6 10 59.6 | 15.544 |
| 3 | 11 14 50.23 | 1.9578 | 5 55 26.5 | 15.559 |
| 4 | 11 16 47.60 | 1.9546 | 5 39 52.5 | 15.572 |
| 5 | 11 18 44.78 | 1.9515 | 5 24 17.8 | 15.584 |
| 6 | 11 20 41.78 | 1.9485 | 5 8 42.4 | 15.596 |
| 7 | 11 22 38.60 | 1.9455 | 4 53 6.3 | 15.606 |
| 8 | 11 24 35.24 | 1.9425 | 4 37 29.7 | 15.614 |
| 9 | 11 26 31.70 | 1.9397 | 4 21 52.6 | 15.622 |
| 10 | 11 28 28.00 | 1.9371 | 4 6 15.0 | 15.630 |
| 11 | 11 30 24.15 | 1.9345 | 3 50 37.0 | 15.636 |
| 12 | 11 32 20.14 | 1.9319 | 3 34 58.7 | 15.640 |
| 13 | 11 34 15.98 | 1.9295 | 3 19 20.2 | 15.642 |
| 14 | 11 36 11.68 | 1.9272 | 3 3 41.6 | 15.644 |
| 15 | 11 38 7.24 | 1.9249 | 2 48 2.9 | 15.645 |
| 16 | 11 40 2.67 | 1.9227 | 2 32 24.2 | 15.645 |
| 17 | 11 41 57.96 | 1.9205 | 2 16 45.5 | 15.644 |
| 18 | 11 43 53.13 | 1.9185 | 2 1 6.9 | 15.642 |
| 19 | 11 45 48.18 | 1.9166 | 1 45 28.5 | 15.638 |
| 20 | 11 47 43.12 | 1.9148 | 1 29 50.3 | 15.634 |
| 21 | 11 49 37.96 | 1.9131 | 1 14 12.4 | 15.628 |
| 22 | 11 51 32.70 | 1.9114 | 0 58 34.9 | 15.622 |
| 23 | 11 53 27.33 | 1.9097 | N. 0 42 57.8 | 15.614 |

### THURSDAY 4.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 11 55 21.86 | 1.9082 | N. 0 27 21.2 | 15.605 |
| 1 | 11 57 16.31 | 1.9068 | N. 0 11 45.2 | 15.595 |
| 2 | 11 59 10.68 | 1.9055 | S. 0 3 50.2 | 15.585 |
| 3 | 12 1 4.97 | 1.9043 | 0 19 25.0 | 15.573 |
| 4 | 12 2 59.19 | 1.9031 | 0 34 59.0 | 15.560 |
| 5 | 12 4 53.34 | 1.9019 | 0 50 32.2 | 15.546 |
| 6 | 12 6 47.42 | 1.9008 | 1 6 4.5 | 15.531 |
| 7 | 12 8 41.44 | 1.8999 | 1 21 35.9 | 15.515 |
| 8 | 12 10 35.41 | 1.8992 | 1 37 6.3 | 15.498 |
| 9 | 12 12 29.34 | 1.8984 | 1 52 35.7 | 15.481 |
| 10 | 12 14 23.22 | 1.8977 | 2 8 4.0 | 15.461 |
| 11 | 12 16 17.06 | 1.8970 | 2 23 31.0 | 15.440 |
| 12 | 12 18 10.86 | 1.8964 | 2 38 56.8 | 15.419 |
| 13 | 12 20 4.63 | 1.8960 | 2 54 21.3 | 15.397 |
| 14 | 12 21 58.38 | 1.8957 | 3 9 44.5 | 15.375 |
| 15 | 12 23 52.12 | 1.8955 | 3 25 6.3 | 15.351 |
| 16 | 12 25 45.84 | 1.8952 | 3 40 26.6 | 15.325 |
| 17 | 12 27 39.54 | 1.8949 | 3 55 45.3 | 15.298 |
| 18 | 12 29 33.23 | 1.8948 | 4 11 2.4 | 15.272 |
| 19 | 12 31 26.92 | 1.8949 | 4 26 17.9 | 15.244 |
| 20 | 12 33 20.62 | 1.8950 | 4 41 31.7 | 15.215 |
| 21 | 12 35 14.32 | 1.8951 | 4 56 43.7 | 15.185 |
| 22 | 12 37 8.03 | 1.8953 | 5 11 53.9 | 15.153 |
| 23 | 12 39 1.76 | 1.8957 | 5 27 2.1 | 15.120 |
| 24 | 12 40 55.52 | 1.8962 | S. 5 42 8.3 | 15.087 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | FRIDAY 5. | | | | | SUNDAY 7. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 12 40 55.52 | 1.8962 | S. 5 42 8.3 | 15.087 | 0 | 14 13 36.71 | 1.9878 | S.16 49 52.3 | 12.366 |
| 1 | 12 42 49.30 | 1.8966 | 5 57 12.6 | 15.054 | 1 | 14 15 36.07 | 1.9909 | 17 2 11.9 | 12.287 |
| 2 | 12 44 43.11 | 1.8970 | 6 12 14.8 | 15.019 | 2 | 14 17 35.62 | 1.9941 | 17 14 26.7 | 12.205 |
| 3 | 12 46 36.94 | 1.8975 | 6 27 14.9 | 14.983 | 3 | 14 19 35.36 | 1.9973 | 17 26 36.5 | 12.123 |
| 4 | 12 48 30.81 | 1.8982 | 6 42 12.8 | 14.946 | 4 | 14 21 35.30 | 2.0006 | 17 38 41.4 | 12.041 |
| 5 | 12 50 24.73 | 1.8990 | 6 57 8.4 | 14.907 | 5 | 14 23 35.43 | 2.0039 | 17 50 41.4 | 11.958 |
| 6 | 12 52 18.69 | 1.8998 | 7 12 1.7 | 14.868 | 6 | 14 25 35.76 | 2.0072 | 18 2 36.3 | 11.873 |
| 7 | 12 54 12.70 | 1.9007 | 7 26 52.6 | 14.828 | 7 | 14 27 36.29 | 2.0105 | 18 14 26.1 | 11.787 |
| 8 | 12 56 6.77 | 1.9016 | 7 41 41.1 | 14.788 | 8 | 14 29 37.02 | 2.0138 | 18 26 10.7 | 11.700 |
| 9 | 12 58 0.89 | 1.9025 | 7 56 27.2 | 14.747 | 9 | 14 31 37.95 | 2.0172 | 18 37 50.1 | 11.612 |
| 10 | 12 59 55.07 | 1.9037 | 8 11 10.8 | 14.704 | 10 | 14 33 39.08 | 2.0206 | 18 49 24.2 | 11.524 |
| 11 | 13 1 49.33 | 1.9049 | 8 25 51.7 | 14.659 | 11 | 14 35 40.42 | 2.0241 | 19 0 53.0 | 11.435 |
| 12 | 13 3 43.66 | 1.9061 | 8 40 29.9 | 14.614 | 12 | 14 37 41.97 | 2.0275 | 19 12 16.4 | 11.344 |
| 13 | 13 5 38.06 | 1.9073 | 8 55 5.4 | 14.569 | 13 | 14 39 43.72 | 2.0309 | 19 23 34.3 | 11.253 |
| 14 | 13 7 32.54 | 1.9087 | 9 9 38.2 | 14.522 | 14 | 14 41 45.68 | 2.0345 | 19 34 46.8 | 11.162 |
| 15 | 13 9 27.10 | 1.9101 | 9 24 8.1 | 14.474 | 15 | 14 43 47.86 | 2.0381 | 19 45 53.8 | 11.070 |
| 16 | 13 11 21.75 | 1.9115 | 9 38 35.1 | 14.426 | 16 | 14 45 50.25 | 2.0416 | 19 56 55.2 | 10.976 |
| 17 | 13 13 16.48 | 1.9130 | 9 52 59.2 | 14.377 | 17 | 14 47 52.85 | 2.0451 | 20 7 50.9 | 10.881 |
| 18 | 13 15 11.31 | 1.9146 | 10 7 20.4 | 14.327 | 18 | 14 49 55.66 | 2.0487 | 20 18 40.9 | 10.786 |
| 19 | 13 17 6.24 | 1.9163 | 10 21 38.5 | 14.275 | 19 | 14 51 58.69 | 2.0522 | 20 29 25.2 | 10.689 |
| 20 | 13 19 1.27 | 1.9180 | 10 35 53.4 | 14.222 | 20 | 14 54 1.93 | 2.0558 | 20 40 3.6 | 10.591 |
| 21 | 13 20 56.40 | 1.9198 | 10 50 5.1 | 14.168 | 21 | 14 56 5.39 | 2.0594 | 20 50 36.1 | 10.493 |
| 22 | 13 22 51.64 | 1.9216 | 11 4 13.6 | 14.115 | 22 | 14 58 9.06 | 2.0630 | 21 1 2.7 | 10.394 |
| 23 | 13 24 46.99 | 1.9235 | S.11 18 18.9 | 14.060 | 23 | 15 0 12.95 | 2.0667 | S.21 11 23.4 | 10.294 |
| | SATURDAY 6. | | | | | MONDAY 8. | | | |
| 0 | 13 26 42.46 | 1.9255 | S.11 32 20.8 | 14.003 | 0 | 15 2 17.06 | 2.0703 | S.21 21 38.0 | 10.193 |
| 1 | 13 28 38.05 | 1.9275 | 11 46 19.3 | 13.946 | 1 | 15 4 21.39 | 2.0739 | 21 31 46.5 | 10.091 |
| 2 | 13 30 33.76 | 1.9295 | 12 0 14.3 | 13.887 | 2 | 15 6 25.93 | 2.0775 | 21 41 48.9 | 9.989 |
| 3 | 13 32 29.59 | 1.9317 | 12 14 5.8 | 13.828 | 3 | 15 8 30.69 | 2.0812 | 21 51 45.2 | 9.887 |
| 4 | 13 34 25.56 | 1.9339 | 12 27 53.7 | 13.768 | 4 | 15 10 35.67 | 2.0848 | 22 1 35.3 | 9.782 |
| 5 | 13 36 21.66 | 1.9361 | 12 41 38.0 | 13.707 | 5 | 15 12 40.87 | 2.0885 | 22 11 19.0 | 9.676 |
| 6 | 13 38 17.89 | 1.9383 | 12 55 18.5 | 13.644 | 6 | 15 14 46.29 | 2.0922 | 22 20 56.4 | 9.570 |
| 7 | 13 40 14.26 | 1.9407 | 13 8 55.3 | 13.582 | 7 | 15 16 51.93 | 2.0957 | 22 30 27.4 | 9.463 |
| 8 | 13 42 10.78 | 1.9432 | 13 22 28.3 | 13.518 | 8 | 15 18 57.78 | 2.0993 | 22 39 51.9 | 9.355 |
| 9 | 13 44 7.44 | 1.9456 | 13 35 57.5 | 13.454 | 9 | 15 21 3.85 | 2.1030 | 22 49 10.0 | 9.247 |
| 10 | 13 46 4.25 | 1.9481 | 13 49 22.8 | 13.388 | 10 | 15 23 10.14 | 2.1066 | 22 58 21.6 | 9.138 |
| 11 | 13 48 1.21 | 1.9506 | 14 2 44.0 | 13.320 | 11 | 15 25 16.64 | 2.1102 | 23 7 26.6 | 9.027 |
| 12 | 13 49 58.32 | 1.9532 | 14 16 1.2 | 13.252 | 12 | 15 27 23.36 | 2.1137 | 23 16 24.9 | 8.916 |
| 13 | 13 51 55.59 | 1.9558 | 14 29 14.3 | 13.184 | 13 | 15 29 30.29 | 2.1173 | 23 25 16.5 | 8.804 |
| 14 | 13 53 53.02 | 1.9586 | 14 42 23.3 | 13.115 | 14 | 15 31 37.44 | 2.1209 | 23 34 1.4 | 8.692 |
| 15 | 13 55 50.62 | 1.9613 | 14 55 28.1 | 13.044 | 15 | 15 33 44.80 | 2.1244 | 23 42 39.6 | 8.579 |
| 16 | 13 57 48.38 | 1.9641 | 15 8 28.6 | 12.972 | 16 | 15 35 52.37 | 2.1279 | 23 51 10.9 | 8.465 |
| 17 | 13 59 46.31 | 1.9668 | 15 21 24.8 | 12.900 | 17 | 15 38 0.15 | 2.1314 | 23 59 35.4 | 8.351 |
| 18 | 14 1 44.40 | 1.9697 | 15 34 16.6 | 12.827 | 18 | 15 40 8.14 | 2.1349 | 24 7 53.0 | 8.235 |
| 19 | 14 3 42.67 | 1.9727 | 15 47 4.0 | 12.752 | 19 | 15 42 16.34 | 2.1383 | 24 16 3.6 | 8.118 |
| 20 | 14 5 41.12 | 1.9756 | 15 59 46.9 | 12.677 | 20 | 15 44 24.74 | 2.1418 | 24 24 7.2 | 8.002 |
| 21 | 14 7 39.74 | 1.9785 | 16 12 25.2 | 12.600 | 21 | 15 46 33.35 | 2.1452 | 24 32 3.8 | 7.884 |
| 22 | 14 9 38.54 | 1.9816 | 16 24 58.9 | 12.523 | 22 | 15 48 42.16 | 2.1485 | 24 39 53.3 | 7.765 |
| 23 | 14 11 37.53 | 1.9847 | 16 37 28.0 | 12.445 | 23 | 15 50 51.17 | 2.1519 | 24 47 35.6 | 7.645 |
| 24 | 14 13 36.71 | 1.9878 | S.16 49 52.3 | 12.366 | 24 | 15 53 0.39 | 2.1552 | S.24 55 10.7 | 7.525 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | **TUESDAY 9.** | | | | | **THURSDAY 11.** | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 15 53 0.39 | 2.1552 | S.24 55 10.7 | 7.525 | 0 | 17 39 19.52 | 2.2497 | S.28 27 28.4 | 1.165 |
| 1 | 15 55 9.80 | 2.1585 | 25 2 38.6 | 7.405 | 1 | 17 41 34.51 | 2.2498 | 28 28 34.1 | 1.025 |
| 2 | 15 57 19.41 | 2.1617 | 25 9 59.3 | 7.284 | 2 | 17 43 49.50 | 2.2499 | 28 29 31.4 | 0.886 |
| 3 | 15 59 29.21 | 2.1649 | 25 17 12.7 | 7.162 | 3 | 17 46 4.50 | 2.2500 | 28 30 20.4 | 0.747 |
| 4 | 16 1 39.20 | 2.1681 | 25 24 18.7 | 7.039 | 4 | 17 48 19.50 | 2.2499 | 28 31 1.0 | 0.607 |
| 5 | 16 3 49.38 | 2.1712 | 25 31 17.4 | 6.916 | 5 | 17 50 34.49 | 2.2497 | 28 31 33.3 | 0.468 |
| 6 | 16 5 59.75 | 2.1743 | 25 38 8.6 | 6.791 | 6 | 17 52 49.47 | 2.2495 | 28 31 57.2 | 0.328 |
| 7 | 16 8 10.30 | 2.1774 | 25 44 52.3 | 6.667 | 7 | 17 55 4.43 | 2.2492 | 28 32 12.7 | 0.189 |
| 8 | 16 10 21.04 | 2.1804 | 25 51 28.6 | 6.543 | 8 | 17 57 19.37 | 2.2488 | 28 32 19.9 | −0.050 |
| 9 | 16 12 31.95 | 2.1833 | 25 57 57.4 | 6.417 | 9 | 17 59 34.29 | 2.2484 | 28 32 18.7 | +0.089 |
| 10 | 16 14 43.04 | 2.1862 | 26 4 18.6 | 6.289 | 10 | 18 1 49.18 | 2.2478 | 28 32 9.2 | 0.228 |
| 11 | 16 16 54.30 | 2.1891 | 26 10 32.1 | 6.162 | 11 | 18 4 4.03 | 2.2471 | 28 31 51.3 | 0.367 |
| 12 | 16 19 5.73 | 2.1919 | 26 16 38.0 | 6.034 | 12 | 18 6 18.83 | 2.2463 | 28 31 25.1 | 0.506 |
| 13 | 16 21 17.33 | 2.1947 | 26 22 36.2 | 5.906 | 13 | 18 8 33.59 | 2.2456 | 28 30 50.6 | 0.644 |
| 14 | 16 23 29.10 | 2.1975 | 26 28 26.7 | 5.777 | 14 | 18 10 48.30 | 2.2447 | 28 30 7.8 | 0.783 |
| 15 | 16 25 41.03 | 2.2002 | 26 34 9.5 | 5.648 | 15 | 18 13 2.95 | 2.2437 | 28 29 16.6 | 0.922 |
| 16 | 16 27 53.12 | 2.2027 | 26 39 44.5 | 5.518 | 16 | 18 15 17.54 | 2.2427 | 28 28 17.1 | 1.060 |
| 17 | 16 30 5.36 | 2.2052 | 26 45 11.7 | 5.388 | 17 | 18 17 32.07 | 2.2416 | 28 27 9.4 | 1.197 |
| 18 | 16 32 17.74 | 2.2076 | 26 50 31.1 | 5.258 | 18 | 18 19 46.53 | 2.2403 | 28 25 53.5 | 1.334 |
| 19 | 16 34 30.27 | 2.2101 | 26 55 42.6 | 5.126 | 19 | 18 22 0.91 | 2.2390 | 28 24 29.3 | 1.472 |
| 20 | 16 36 42.95 | 2.2125 | 27 0 46.2 | 4.993 | 20 | 18 24 15.21 | 2.2377 | 28 22 56.8 | 1.610 |
| 21 | 16 38 55.77 | 2.2148 | 27 5 41.8 | 4.861 | 21 | 18 26 29.43 | 2.2363 | 28 21 16.1 | 1.747 |
| 22 | 16 41 8.73 | 2.2171 | 27 10 29.5 | 4.728 | 22 | 18 28 43.56 | 2.2348 | 28 19 27.2 | 1.883 |
| 23 | 16 43 21.82 | 2.2192 | S.27 15 9.2 | 4.596 | 23 | 18 30 57.60 | 2.2332 | S.28 17 30.1 | 2.020 |
| | **WEDNESDAY 10.** | | | | | **FRIDAY 12.** | | | |
| 0 | 16 45 35.03 | 2.2212 | S.27 19 41.0 | 4.463 | 0 | 18 33 11.54 | 2.2315 | S.28 15 24.8 | 2.156 |
| 1 | 16 47 48.37 | 2.2233 | 27 24 4.7 | 4.328 | 1 | 18 35 25.38 | 2.2297 | 28 13 11.4 | 2.292 |
| 2 | 16 50 1.83 | 2.2253 | 27 28 20.3 | 4.193 | 2 | 18 37 39.11 | 2.2279 | 28 10 49.8 | 2.427 |
| 3 | 16 52 15.41 | 2.2272 | 27 32 27.9 | 4.059 | 3 | 18 39 52.73 | 2.2261 | 28 8 20.1 | 2.562 |
| 4 | 16 54 29.10 | 2.2291 | 27 36 27.4 | 3.924 | 4 | 18 42 6.24 | 2.2242 | 28 5 42.3 | 2.697 |
| 5 | 16 56 42.90 | 2.2308 | 27 40 18.8 | 3.788 | 5 | 18 44 19.63 | 2.2221 | 28 2 56.4 | 2.832 |
| 6 | 16 58 56.80 | 2.2325 | 27 44 2.0 | 3.652 | 6 | 18 46 32.89 | 2.2200 | 28 0 2.5 | 2.966 |
| 7 | 17 1 10.80 | 2.2341 | 27 47 37.0 | 3.515 | 7 | 18 48 46.03 | 2.2179 | 27 57 0.5 | 3.100 |
| 8 | 17 3 24.89 | 2.2356 | 27 51 3.8 | 3.378 | 8 | 18 50 59.04 | 2.2157 | 27 53 50.5 | 3.233 |
| 9 | 17 5 39.07 | 2.2371 | 27 54 22.4 | 3.242 | 9 | 18 53 11.91 | 2.2134 | 27 50 32.6 | 3.365 |
| 10 | 17 7 53.34 | 2.2386 | 27 57 32.8 | 3.105 | 10 | 18 55 24.65 | 2.2111 | 27 47 6.7 | 3.497 |
| 11 | 17 10 7.70 | 2.2399 | 28 0 35.0 | 2.968 | 11 | 18 57 37.25 | 2.2088 | 27 43 32.9 | 3.630 |
| 12 | 17 12 22.13 | 2.2411 | 28 3 29.0 | 2.831 | 12 | 18 59 49.70 | 2.2063 | 27 39 51.1 | 3.762 |
| 13 | 17 14 36.63 | 2.2422 | 28 6 14.7 | 2.693 | 13 | 19 2 2.00 | 2.2038 | 27 36 1.5 | 3.893 |
| 14 | 17 16 51.20 | 2.2433 | 28 8 52.1 | 2.554 | 14 | 19 4 14.15 | 2.2012 | 27 32 4.0 | 4.023 |
| 15 | 17 19 5.83 | 2.2443 | 28 11 21.2 | 2.416 | 15 | 19 6 26.14 | 2.1985 | 27 27 58.7 | 4.153 |
| 16 | 17 21 20.52 | 2.2452 | 28 13 42.0 | 2.277 | 16 | 19 8 37.97 | 2.1958 | 27 23 45.6 | 4.283 |
| 17 | 17 23 35.26 | 2.2461 | 28 15 54.5 | 2.138 | 17 | 19 10 49.64 | 2.1932 | 27 19 24.7 | 4.412 |
| 18 | 17 25 50.05 | 2.2468 | 28 17 58.6 | 1.999 | 18 | 19 13 1.15 | 2.1904 | 27 14 56.1 | 4.541 |
| 19 | 17 28 4.88 | 2.2475 | 28 19 54.4 | 1.861 | 19 | 19 15 12.49 | 2.1875 | 27 10 19.8 | 4.669 |
| 20 | 17 30 19.75 | 2.2481 | 28 21 41.9 | 1.722 | 20 | 19 17 23.65 | 2.1846 | 27 5 35.8 | 4.797 |
| 21 | 17 32 34.65 | 2.2486 | 28 23 21.1 | 1.583 | 21 | 19 19 34.64 | 2.1817 | 27 0 44.1 | 4.924 |
| 22 | 17 34 49.58 | 2.2491 | 28 24 51.9 | 1.443 | 22 | 19 21 45.45 | 2.1787 | 26 55 44.9 | 5.050 |
| 23 | 17 37 4.54 | 2.2495 | 28 26 14.3 | 1.304 | 23 | 19 23 56.08 | 2.1757 | 26 50 38.1 | 5.177 |
| 24 | 17 39 19.52 | 2.2497 | S.28 27 28.4 | 1.165 | 24 | 19 26 6.54 | 2.1727 | S.26 45 23.7 | 5.303 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | SATURDAY 13. | | | | | MONDAY 15. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 19 26 6.54 | 2.1727 | S.26 45 23.7 | 5.303 | 0 | 21 6 27.16 | 2.0072 | S.20 18 24.2 | 10.561 |
| 1 | 19 28 16.81 | 2.1696 | 26 40 1.8 | 5.427 | 1 | 21 8 27.49 | 2.0039 | 20 7 47.7 | 10.654 |
| 2 | 19 30 26.89 | 2.1664 | 26 34 32.5 | 5.551 | 2 | 21 10 27.63 | 2.0008 | 19 57 5.7 | 10.747 |
| 3 | 19 32 36.78 | 2.1632 | 26 28 55.7 | 5.675 | 3 | 21 12 27.59 | 1.9977 | 19 46 18.1 | 10.838 |
| 4 | 19 34 46.48 | 2.1600 | 26 23 11.5 | 5.798 | 4 | 21 14 27.36 | 1.9946 | 19 35 25.1 | 10.928 |
| 5 | 19 36 55.98 | 2.1567 | 26 17 19.9 | 5.921 | 5 | 21 16 26.94 | 1.9915 | 19 24 26.7 | 11.018 |
| 6 | 19 39 5.29 | 2.1535 | 26 11 21.0 | 6.043 | 6 | 21 18 26.34 | 1.9884 | 19 13 23.0 | 11.107 |
| 7 | 19 41 14.40 | 2.1502 | 26 5 14.8 | 6.164 | 7 | 21 20 25.55 | 1.9854 | 19 2 13.9 | 11.195 |
| 8 | 19 43 23.31 | 2.1468 | 25 59 1.3 | 6.285 | 8 | 21 22 24.59 | 1.9825 | 18 50 59.6 | 11.283 |
| 9 | 19 45 32.02 | 2.1435 | 25 52 40.6 | 6.405 | 9 | 21 24 23.45 | 1.9795 | 18 39 40.0 | 11.370 |
| 10 | 19 47 40.53 | 2.1401 | 25 46 12.7 | 6.524 | 10 | 21 26 22.13 | 1.9766 | 18 28 15.2 | 11.456 |
| 11 | 19 49 48.83 | 2.1367 | 25 39 37.7 | 6.643 | 11 | 21 28 20.64 | 1.9738 | 18 16 45.3 | 11.541 |
| 12 | 19 51 56.93 | 2.1333 | 25 32 55.6 | 6.761 | 12 | 21 30 18.99 | 1.9711 | 18 5 10.3 | 11.626 |
| 13 | 19 54 4.82 | 2.1298 | 25 26 6.4 | 6.878 | 13 | 21 32 17.17 | 1.9683 | 17 53 30.2 | 11.710 |
| 14 | 19 56 12.50 | 2.1263 | 25 19 10.2 | 6.996 | 14 | 21 34 15.18 | 1.9655 | 17 41 45.1 | 11.793 |
| 15 | 19 58 19.98 | 2.1229 | 25 12 6.9 | 7.113 | 15 | 21 36 13.03 | 1.9628 | 17 29 55.0 | 11.876 |
| 16 | 20 0 27.25 | 2.1193 | 25 4 56.7 | 7.228 | 16 | 21 38 10.72 | 1.9602 | 17 18 0.0 | 11.958 |
| 17 | 20 2 34.30 | 2.1157 | 24 57 39.6 | 7.342 | 17 | 21 40 8.26 | 1.9577 | 17 6 0.1 | 12.039 |
| 18 | 20 4 41.13 | 2.1121 | 24 50 15.7 | 7.455 | 18 | 21 42 5.64 | 1.9551 | 16 53 55.3 | 12.120 |
| 19 | 20 6 47.75 | 2.1086 | 24 42 45.0 | 7.569 | 19 | 21 44 2.87 | 1.9527 | 16 41 45.7 | 12.199 |
| 20 | 20 8 54.16 | 2.1051 | 24 35 7.4 | 7.683 | 20 | 21 45 59.96 | 1.9502 | 16 29 31.4 | 12.278 |
| 21 | 20 11 0.36 | 2.1015 | 24 27 23.0 | 7.796 | 21 | 21 47 56.90 | 1.9478 | 16 17 12.4 | 12.356 |
| 22 | 20 13 6.34 | 2.0979 | 24 19 31.9 | 7.907 | 22 | 21 49 53.70 | 1.9455 | 16 4 48.7 | 12.433 |
| 23 | 20 15 12.11 | 2.0944 | S.24 11 34.2 | 8.017 | 23 | 21 51 50.36 | 1.9433 | S.15 52 20.4 | 12.511 |
| | SUNDAY 14. | | | | | TUESDAY 16. | | | |
| 0 | 20 17 17.67 | 2.0908 | S.24 3 29.8 | 8.128 | 0 | 21 53 46.89 | 1.9411 | S.15 39 47.4 | 12.588 |
| 1 | 20 19 23.01 | 2.0872 | 23 55 18.8 | 8.238 | 1 | 21 55 43.29 | 1.9389 | 15 27 9.9 | 12.663 |
| 2 | 20 21 28.13 | 2.0836 | 23 47 1.3 | 8.346 | 2 | 21 57 39.56 | 1.9368 | 15 14 27.9 | 12.737 |
| 3 | 20 23 33.04 | 2.0800 | 23 38 37.3 | 8.454 | 3 | 21 59 35.70 | 1.9347 | 15 1 41.5 | 12.810 |
| 4 | 20 25 37.73 | 2.0763 | 23 30 6.8 | 8.562 | 4 | 22 1 31.72 | 1.9327 | 14 48 50.7 | 12.884 |
| 5 | 20 27 42.20 | 2.0727 | 23 21 29.9 | 8.668 | 5 | 22 3 27.63 | 1.9308 | 14 35 55.4 | 12.957 |
| 6 | 20 29 46.46 | 2.0692 | 23 12 46.7 | 8.773 | 6 | 22 5 23.42 | 1.9289 | 14 22 55.8 | 13.029 |
| 7 | 20 31 50.50 | 2.0656 | 23 3 57.1 | 8.879 | 7 | 22 7 19.10 | 1.9272 | 14 9 51.9 | 13.100 |
| 8 | 20 33 54.33 | 2.0621 | 22 55 1.2 | 8.984 | 8 | 22 9 14.68 | 1.9254 | 13 56 43.8 | 13.170 |
| 9 | 20 35 57.95 | 2.0585 | 22 45 59.0 | 9.088 | 9 | 22 11 10.15 | 1.9237 | 13 43 31.5 | 13.240 |
| 10 | 20 38 1.35 | 2.0549 | 22 36 50.6 | 9.192 | 10 | 22 13 5.52 | 1.9221 | 13 30 15.0 | 13.309 |
| 11 | 20 40 4.54 | 2.0514 | 22 27 36.0 | 9.294 | 11 | 22 15 0.80 | 1.9206 | 13 16 54.4 | 13.377 |
| 12 | 20 42 7.52 | 2.0479 | 22 18 15.3 | 9.396 | 12 | 22 16 55.99 | 1.9191 | 13 3 29.8 | 13.444 |
| 13 | 20 44 10.29 | 2.0444 | 22 8 48.5 | 9.497 | 13 | 22 18 51.09 | 1.9176 | 12 50 1.1 | 13.512 |
| 14 | 20 46 12.85 | 2.0409 | 21 59 15.7 | 9.597 | 14 | 22 20 46.10 | 1.9162 | 12 36 28.4 | 13.578 |
| 15 | 20 48 15.20 | 2.0374 | 21 49 36.8 | 9.696 | 15 | 22 22 41.03 | 1.9149 | 12 22 51.8 | 13.643 |
| 16 | 20 50 17.34 | 2.0339 | 21 39 52.0 | 9.796 | 16 | 22 24 35.89 | 1.9137 | 12 9 11.3 | 13.708 |
| 17 | 20 52 19.27 | 2.0305 | 21 30 1.3 | 9.894 | 17 | 22 26 30.68 | 1.9125 | 11 55 26.9 | 13.772 |
| 18 | 20 54 21.00 | 2.0272 | 21 20 4.7 | 9.992 | 18 | 22 28 25.39 | 1.9113 | 11 41 38.7 | 13.834 |
| 19 | 20 56 22.53 | 2.0238 | 21 10 2.3 | 10.088 | 19 | 22 30 20.04 | 1.9103 | 11 27 46.8 | 13.896 |
| 20 | 20 58 23.86 | 2.0204 | 20 59 54.1 | 10.185 | 20 | 22 32 14.63 | 1.9094 | 11 13 51.2 | 13.957 |
| 21 | 21 0 24.98 | 2.0170 | 20 49 40.1 | 10.281 | 21 | 22 34 9.17 | 1.9085 | 10 59 51.9 | 14.018 |
| 22 | 21 2 25.90 | 2.0137 | 20 39 20.4 | 10.375 | 22 | 22 36 3.65 | 1.9077 | 10 45 49.0 | 14.078 |
| 23 | 21 4 26.63 | 2.0105 | 20 28 55.1 | 10.468 | 23 | 22 37 58.09 | 1.9070 | 10 31 42.5 | 14.138 |
| 24 | 21 6 27.16 | 2.0072 | S.20 18 24.2 | 10.561 | 24 | 22 39 52.49 | 1.9063 | S.10 17 32.4 | 14.197 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

#### WEDNESDAY 17.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 22 39 52.49 | 1.9063 | S. 10 17 32.4 | 14.197 |
| 1 | 22 41 46.85 | 1.9057 | 10 3 18.8 | 14.255 |
| 2 | 22 43 41.17 | 1.9051 | 9 49 1.8 | 14.312 |
| 3 | 22 45 35.46 | 1.9047 | 9 34 41.4 | 14.368 |
| 4 | 22 47 29.73 | 1.9043 | 9 20 17.6 | 14.424 |
| 5 | 22 49 23.97 | 1.9039 | 9 5 50.5 | 14.479 |
| 6 | 22 51 18.20 | 1.9037 | 8 51 20.1 | 14.533 |
| 7 | 22 53 12.42 | 1.9036 | 8 36 46.5 | 14.586 |
| 8 | 22 55 6.63 | 1.9035 | 8 22 9.8 | 14.638 |
| 9 | 22 57 0.84 | 1.9035 | 8 7 30.0 | 14.689 |
| 10 | 22 58 55.05 | 1.9036 | 7 52 47.1 | 14.740 |
| 11 | 23 0 49.27 | 1.9037 | 7 38 1.2 | 14.791 |
| 12 | 23 2 43.49 | 1.9039 | 7 23 12.2 | 14.841 |
| 13 | 23 4 37.73 | 1.9042 | 7 8 20.3 | 14.889 |
| 14 | 23 6 31.99 | 1.9046 | 6 53 25.6 | 14.936 |
| 15 | 23 8 26.28 | 1.9051 | 6 38 28.0 | 14.983 |
| 16 | 23 10 20.60 | 1.9057 | 6 23 27.6 | 15.029 |
| 17 | 23 12 14.96 | 1.9063 | 6 8 24.5 | 15.073 |
| 18 | 23 14 9.35 | 1.9069 | 5 53 18.8 | 15.118 |
| 19 | 23 16 3.79 | 1.9077 | 5 38 10.4 | 15.162 |
| 20 | 23 17 58.28 | 1.9086 | 5 22 59.4 | 15.204 |
| 21 | 23 19 52.82 | 1.9095 | 5 7 45.9 | 15.245 |
| 22 | 23 21 47.42 | 1.9106 | 4 52 30.0 | 15.285 |
| 23 | 23 23 42.09 | 1.9117 | S. 4 37 11.7 | 15.325 |

#### THURSDAY 18.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 23 25 36.82 | 1.9129 | S. 4 21 51.0 | 15.364 |
| 1 | 23 27 31.63 | 1.9142 | 4 6 28.0 | 15.402 |
| 2 | 23 29 26.52 | 1.9156 | 3 51 2.7 | 15.440 |
| 3 | 23 31 21.50 | 1.9171 | 3 35 35.2 | 15.476 |
| 4 | 23 33 16.57 | 1.9187 | 3 20 5.6 | 15.511 |
| 5 | 23 35 11.74 | 1.9203 | 3 4 33.9 | 15.546 |
| 6 | 23 37 7.00 | 1.9219 | 2 49 0.1 | 15.580 |
| 7 | 23 39 2.37 | 1.9237 | 2 33 24.3 | 15.612 |
| 8 | 23 40 57.85 | 1.9257 | 2 17 46.7 | 15.643 |
| 9 | 23 42 53.45 | 1.9277 | 2 2 7.2 | 15.673 |
| 10 | 23 44 49.17 | 1.9297 | 1 46 25.9 | 15.703 |
| 11 | 23 46 45.02 | 1.9319 | 1 30 42.8 | 15.731 |
| 12 | 23 48 41.00 | 1.9342 | 1 14 58.1 | 15.758 |
| 13 | 23 50 37.12 | 1.9366 | 0 59 11.8 | 15.785 |
| 14 | 23 52 33.39 | 1.9390 | 0 43 23.9 | 15.812 |
| 15 | 23 54 29.80 | 1.9414 | 0 27 34.4 | 15.837 |
| 16 | 23 56 26.36 | 1.9441 | S. 0 11 43.5 | 15.859 |
| 17 | 23 58 23.09 | 1.9468 | N. 0 4 8.7 | 15.881 |
| 18 | 0 0 19.98 | 1.9496 | 0 20 2.2 | 15.902 |
| 19 | 0 2 17.04 | 1.9525 | 0 35 56.9 | 15.922 |
| 20 | 0 4 14.28 | 1.9555 | 0 51 52.9 | 15.942 |
| 21 | 0 6 11.70 | 1.9586 | 1 7 50.0 | 15.960 |
| 22 | 0 8 9.31 | 1.9618 | 1 23 48.1 | 15.977 |
| 23 | 0 10 7.12 | 1.9651 | 1 39 47.2 | 15.992 |
| 24 | 0 12 5.12 | 1.9684 | N. 1 55 47.1 | 16.006 |

#### FRIDAY 19.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 0 12 5.12 | 1.9684 | N. 1 55 47.1 | 16.006 |
| 1 | 0 14 3.32 | 1.9719 | 2 11 47.9 | 16.020 |
| 2 | 0 16 1.74 | 1.9755 | 2 27 49.5 | 16.032 |
| 3 | 0 18 0.38 | 1.9792 | 2 43 51.7 | 16.043 |
| 4 | 0 19 59.24 | 1.9828 | 2 59 54.6 | 16.053 |
| 5 | 0 21 58.32 | 1.9866 | 3 15 58.1 | 16.062 |
| 6 | 0 23 57.63 | 1.9905 | 3 32 2.0 | 16.068 |
| 7 | 0 25 57.18 | 1.9946 | 3 48 6.3 | 16.074 |
| 8 | 0 27 56.98 | 1.9987 | 4 4 10.9 | 16.079 |
| 9 | 0 29 57.03 | 2.0030 | 4 20 15.8 | 16.083 |
| 10 | 0 31 57.34 | 2.0073 | 4 36 20.9 | 16.086 |
| 11 | 0 33 57.91 | 2.0117 | 4 52 26.1 | 16.086 |
| 12 | 0 35 58.74 | 2.0162 | 5 8 31.2 | 16.085 |
| 13 | 0 37 59.85 | 2.0208 | 5 24 36.3 | 16.083 |
| 14 | 0 40 1.24 | 2.0255 | 5 40 41.2 | 16.080 |
| 15 | 0 42 2.91 | 2.0303 | 5 56 45.9 | 16.076 |
| 16 | 0 44 4.87 | 2.0352 | 6 12 50.3 | 16.069 |
| 17 | 0 46 7.13 | 2.0402 | 6 28 54.2 | 16.061 |
| 18 | 0 48 9.70 | 2.0454 | 6 44 57.6 | 16.052 |
| 19 | 0 50 12.58 | 2.0506 | 7 1 0.4 | 16.042 |
| 20 | 0 52 15.77 | 2.0558 | 7 17 2.6 | 16.030 |
| 21 | 0 54 19.27 | 2.0611 | 7 33 4.0 | 16.017 |
| 22 | 0 56 23.10 | 2.0667 | 7 49 4.6 | 16.002 |
| 23 | 0 58 27.27 | 2.0723 | N. 8 5 4.2 | 15.985 |

#### SATURDAY 20.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 1 0 31.77 | 2.0779 | N. 8 21 2.8 | 15.967 |
| 1 | 1 2 36.62 | 2.0837 | 8 37 0.3 | 15.947 |
| 2 | 1 4 41.82 | 2.0895 | 8 52 56.5 | 15.926 |
| 3 | 1 6 47.36 | 2.0953 | 9 8 51.4 | 15.903 |
| 4 | 1 8 53.26 | 2.1014 | 9 24 44.9 | 15.879 |
| 5 | 1 10 59.53 | 2.1076 | 9 40 36.9 | 15.853 |
| 6 | 1 13 6.17 | 2.1138 | 9 56 27.3 | 15.826 |
| 7 | 1 15 13.19 | 2.1202 | 10 12 16.0 | 15.797 |
| 8 | 1 17 20.60 | 2.1267 | 10 28 2.9 | 15.765 |
| 9 | 1 19 28.40 | 2.1332 | 10 43 47.8 | 15.732 |
| 10 | 1 21 36.59 | 2.1397 | 10 59 30.7 | 15.697 |
| 11 | 1 23 45.17 | 2.1463 | 11 15 11.5 | 15.661 |
| 12 | 1 25 54.15 | 2.1531 | 11 30 50.0 | 15.623 |
| 13 | 1 28 3.54 | 2.1600 | 11 46 26.2 | 15.583 |
| 14 | 1 30 13.35 | 2.1671 | 12 1 59.9 | 15.541 |
| 15 | 1 32 23.59 | 2.1742 | 12 17 31.1 | 15.497 |
| 16 | 1 34 34.25 | 2.1813 | 12 32 59.6 | 15.452 |
| 17 | 1 36 45.34 | 2.1885 | 12 48 25.3 | 15.404 |
| 18 | 1 38 56.87 | 2.1958 | 13 3 48.1 | 15.355 |
| 19 | 1 41 8.84 | 2.2032 | 13 19 7.9 | 15.303 |
| 20 | 1 43 21.26 | 2.2107 | 13 34 24.5 | 15.250 |
| 21 | 1 45 34.13 | 2.2182 | 13 49 37.9 | 15.195 |
| 22 | 1 47 47.45 | 2.2258 | 14 4 47.9 | 15.138 |
| 23 | 1 50 1.23 | 2.2336 | 14 19 54.4 | 15.079 |
| 24 | 1 52 15.48 | 2.2414 | N. 14 34 57.4 | 15.019 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| SUNDAY 21. | | | | | TUESDAY 23. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 1 52 15.48 | 2.2414 | N.14 34 57.4 | 15.019 | 0 | 3 49 45.48 | 2.6583 | N.24 43 33.1 | 9.455 |
| 1 | 1 54 30.20 | 2.2493 | 14 49 56.7 | 14.956 | 1 | 3 52 25.23 | 2.6665 | 24 52 55.3 | 9.283 |
| 2 | 1 56 45.40 | 2.2572 | 15 4 52.1 | 14.890 | 2 | 3 55 5.46 | 2.6744 | 25 2 7.1 | 9.108 |
| 3 | 1 59 1.07 | 2.2652 | 15 19 43.5 | 14.822 | 3 | 3 57 46.16 | 2.6823 | 25 11 8.3 | 8.932 |
| 4 | 2 1 17.22 | 2.2733 | 15 34 30.7 | 14.752 | 4 | 4 0 27.34 | 2.6902 | 25 19 58.9 | 8.754 |
| 5 | 2 3 33.86 | 2.2815 | 15 49 13.7 | 14.681 | 5 | 4 3 8.98 | 2.6978 | 25 28 38.8 | 8.574 |
| 6 | 2 5 51.00 | 2.2897 | 16 3 52.4 | 14.607 | 6 | 4 5 51.08 | 2.7054 | 25 37 7.8 | 8.392 |
| 7 | 2 8 8.63 | 2.2980 | 16 18 26.6 | 14.532 | 7 | 4 8 33.63 | 2.7128 | 25 45 25.8 | 8.207 |
| 8 | 2 10 26.76 | 2.3063 | 16 32 56.2 | 14.454 | 8 | 4 11 16.62 | 2.7202 | 25 53 32.6 | 8.020 |
| 9 | 2 12 45.39 | 2.3147 | 16 47 21.1 | 14.374 | 9 | 4 14 0.05 | 2.7274 | 26 1 28.2 | 7.832 |
| 10 | 2 15 4.53 | 2.3232 | 17 1 41.1 | 14.292 | 10 | 4 16 43.91 | 2.7344 | 26 9 12.4 | 7.641 |
| 11 | 2 17 24.18 | 2.3318 | 17 15 56.1 | 14.207 | 11 | 4 19 28.18 | 2.7412 | 26 16 45.1 | 7.449 |
| 12 | 2 19 44.35 | .2.3404 | 17 30 6.0 | 14.121 | 12 | 4 22 12.85 | 2.7479 | 26 24 6.3 | 7.256 |
| 13 | 2 22 5.03 | 2.3490 | 17 44 10.6 | 14.032 | 13 | 4 24 57.92 | 2.7545 | 26 31 15.8 | 7.060 |
| 14 | 2 24 26.23 | 2.3577 | 17 58 9.8 | 13.941 | 14 | 4 27 43.39 | 2.7609 | 26 38 13.5 | 6.862 |
| 15 | 2 26 47.96 | 2.3665 | 18 12 3.5 | 13.847 | 15 | 4 30 29.23 | 2.7671 | 26 44 59.2 | 6.662 |
| 16 | 2 29 10.21 | 2.3752 | 18 25 51.5 | 13.751 | 16 | 4 33 15.44 | 2.7732 | 26 51 32.9 | 6.461 |
| 17 | 2 31 32.99 | 2.3840 | 18 39 33.6 | 13.653 | 17 | 4 36 2.01 | 2.7790 | 26 57 54.5 | 6.259 |
| 18 | 2 33 56.29 | 2.3928 | 18 53 9.8 | 13.553 | 18 | 4 38 48.92 | 2.7847 | 27 4 4.0 | 6.056 |
| 19 | 2 36 20.13 | 2.4017 | 19 6 39.9 | 13.450 | 19 | 4 41 36.17 | 2.7902 | 27 10 1.2 | 5.850 |
| 20 | 2 38 44.50 | 2.4107 | 19 20 3.8 | 13.345 | 20 | 4 44 23.74 | 2.7954 | 27 15 46.0 | 5.643 |
| 21 | 2 41 9.41 | 2.4197 | 19 33 21.3 | 13.237 | 21 | 4 47 11.62 | 2.8006 | 27 21 18.4 | 5.435 |
| 22 | 2 43 34.86 | 2.4287 | 19 46 32.3 | 13.128 | 22 | 4 49 59.81 | 2.8055 | 27 26 38.2 | 5.224 |
| 23 | 2 46 0.85 | 2.4377 | N.19 59 36.7 | 13.017 | 23 | 4 52 48.28 | 2.8101 | N.27 31 45.3 | 5.013 |
| MONDAY 22. | | | | | WEDNESDAY 24. | | | | |
| 0 | 2 48 27.38 | 2.4467 | N.20 12 34.3 | 12.902 | 0 | 4 55 37.02 | 2.8146 | N.27 36 39.7 | 4.801 |
| 1 | 2 50 54.45 | 2.4557 | 20 25 24.9 | 12.785 | 1 | 4 58 26.03 | 2.8189 | 27 41 21.4 | 4.588 |
| 2 | 2 53 22.06 | 2.4647 | 20 38 8.5 | 12.667 | 2 | 5 1 15.29 | 2.8230 | 27 45 50.3 | 4.373 |
| 3 | 2 55 50.22 | 2.4738 | 20 50 44.9 | 12.546 | 3 | 5 4 4.79 | 2.8268 | 27 50 6.2 | 4 157 |
| 4 | 2 58 18.92 | 2.4829 | 21 3 14.0 | 12.422 | 4 | 5 6 54.51 | 2.8304 | 27 54 9.1 | 3.940 |
| 5 | 3 0 48.17 | 2.4920 | 21 15 35.5 | 12.295 | 5 | 5 9 44.44 | 2.8337 | 27 57 59.0 | 3.723 |
| 6 | 3 3 17.96 | 2.5010 | 21 27 49.4 | 12.167 | 6 | 5 12 34.56 | 2.8368 | 28 1 35.9 | 3.505 |
| 7 | 3 5 48.29 | 2.5101 | 21 39 55.5 | 12.036 | 7 | 5 15 24.86 | 2.8398 | 28 4 59.6 | 3.285 |
| 8 | 3 8 19.17 | 2.5192 | 21 51 53.7 | 11.903 | 8 | 5 18 15.34 | 2.8426 | 28 8 10.1 | 3.065 |
| 9 | 3 10 50.59 | 2.5282 | 22 3 43.9 | 11.768 | 9 | 5 21 5.97 | 2.8450 | 28 11 7.4 | 2.844 |
| 10 | 3 13 22.55 | 2.5372 | 22 15 25.9 | 11.630 | 10 | 5 23 56.74 | 2.8472 | 28 13 51.4 | 2.623 |
| 11 | 3 15 55.05 | 2.5462 | 22 26 59.5 | 11.488 | 11 | 5 26 47.63 | 2.8491 | 28 16 22.2 | 2.401 |
| 12 | 3 18 28.09 | 2.5551 | 22 38 24.5 | 11.345 | 12 | 5 29 38.63 | 2.8508 | 28 18 39.6 | 2.178 |
| 13 | 3 21 1.66 | 2.5640 | 22 49 40.9 | 11.201 | 13 | 5 32 29.73 | 2.8523 | 28 20 43.6 | 1.955 |
| 14 | 3 23 35.77 | 2.5729 | 23 0 48.6 | 11.055 | 14 | 5 35 20.91 | 2.8535 | 28 22 34.2 | 1.732 |
| 15 | 3 26 10.41 | 2.5817 | 23 11 47.5 | 10.906 | 15 | 5 38 12.15 | 2.8545 | 28 24 11.5 | 1.509 |
| 16 | 3 28 45.58 | 2.5905 | 23 22 37.3 | 10.753 | 16 | 5 41 3.45 | 2.8552 | 28 25 35.3 | 1.285 |
| 17 | 3 31 21.27 | 2.5992 | 23 33 17.9 | 10.598 | 17 | 5 43 54.78 | 2.8556 | 28 26 45.7 | 1.061 |
| 18 | 3 33 57.48 | 2.6078 | 23 43 49.1 | 10.441 | 18 | 5 46 46.12 | 2.8558 | 28 27 42.6 | 0.836 |
| 19 | 3 36 34.21 | 2.6164 | 23 54 10.8 | 10.282 | 19 | 5 49 37.47 | 2.8558 | 28 28 26.0 | 0.612 |
| 20 | 3 39 11.45 | 2.6250 | 24 4 23.0 | 10.122 | 20 | 5 52 28.82 | 2.8556 | 28 28 56.0 | 0.388 |
| 21 | 3 41 49.21 | 2.6335 | 24 14 25.5 | 9.959 | 21 | 5 55 20.14 | 2.8550 | 28 29 12.6 | +0.164 |
| 22 | 3 44 27.47 | 2.6418 | 24 24 18.1 | 9.793 | 22 | 5 58 11.42 | 2.8542 | 28 29 15.7 | −0.060 |
| 23 | 3 47 6.23 | 2.6501 | 24 34 0.7 | 9.625 | 23 | 6 1 2.65 | 2.8532 | 28 29 5.4 | 0.283 |
| 24 | 3 49 45.48 | 2.6583 | N.24 43 33.1 | 9.455 | 24 | 6 3 53.81 | 2.8519 | N.28 28 41.7 | 0.507 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | THURSDAY 25. | | | | | SATURDAY 27. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 6 3 53.81 | 2.8519 | N.28 28 41.7 | 0.507 | 0 | 8 15 14.68 | 2.5589 | N.24 6 2.1 | 9.834 |
| 1 | 6 6 44.88 | 2.8503 | 28 28 4.6 | 0.730 | 1 | 8 17 47.94 | 2.5498 | 23 56 7.5 | 9.983 |
| 2 | 6 9 35.85 | 2.8486 | 28 27 14.1 | 0.953 | 2 | 8 20 20.66 | 2.5408 | 23 46 4.1 | 10.130 |
| 3 | 6 12 26.71 | 2.8466 | 28 26 10.2 | 1.176 | 3 | 8 22 52.84 | 2.5317 | 23 35 51.9 | 10.276 |
| 4 | 6 15 17.44 | 2.8443 | 28 24 53.0 | 1.397 | 4 | 8 25 24.47 | 2.5226 | 23 25 31.0 | 10.419 |
| 5 | 6 18 8.03 | 2.8417 | 28 23 22.6 | 1.618 | 5 | 8 27 55.55 | 2.5134 | 23 15 1.6 | 10.559 |
| 6 | 6 20 58.45 | 2.8389 | 28 21 38.9 | 1.838 | 6 | 8 30 26.08 | 2.5042 | 23 4 23.9 | 10.697 |
| 7 | 6 23 48.70 | 2.8360 | 28 19 42.0 | 2.058 | 7 | 8 32 56.06 | 2.4951 | 22 53 37.9 | 10.834 |
| 8 | 6 26 38.77 | 2.8328 | 28 17 31.9 | 2.277 | 8 | 8 35 25.49 | 2.4859 | 22 42 43.8 | 10.968 |
| 9 | 6 29 28.64 | 2.8293 | 28 15 8.7 | 2.495 | 9 | 8 37 54.37 | 2.4768 | 22 31 41.7 | 11.101 |
| 10 | 6 32 18.29 | 2.8256 | 28 12 32.5 | 2.712 | 10 | 8 40 22.70 | 2.4676 | 22 20 31.7 | 11.231 |
| 11 | 6 35 7.71 | 2.8218 | 28 9 43.3 | 2.928 | 11 | 8 42 50.48 | 2.4583 | 22 9 14.0 | 11.358 |
| 12 | 6 37 56.90 | 2.8177 | 28 6 41.1 | 3.144 | 12 | 8 45 17.70 | 2.4491 | 21 57 48.8 | 11.483 |
| 13 | 6 40 45.83 | 2.8133 | 28 3 26.0 | 3.358 | 13 | 8 47 44.37 | 2.4399 | 21 46 16.1 | 11.606 |
| 14 | 6 43 34.49 | 2.8087 | 27 59 58.1 | 3.571 | 14 | 8 50 10.49 | 2.4308 | 21 34 36.1 | 11.727 |
| 15 | 6 46 22.87 | 2.8039 | 27 56 17.5 | 3.782 | 15 | 8 52 36.07 | 2.4217 | 21 22 48.8 | 11.847 |
| 16 | 6 49 10.96 | 2.7989 | 27 52 24.3 | 3.992 | 16 | 8 55 1.10 | 2.4126 | 21 10 54.4 | 11.964 |
| 17 | 6 51 58.74 | 2.7937 | 27 48 18.4 | 4.202 | 17 | 8 57 25.58 | 2.4035 | 20 58 53.1 | 12.078 |
| 18 | 6 54 46.20 | 2.7883 | 27 44 0.0 | 4.410 | 18 | 8 59 49.52 | 2.3945 | 20 46 45.1 | 12.189 |
| 19 | 6 57 33.34 | 2.7827 | 27 39 29.2 | 4.616 | 19 | 9 2 12.92 | 2.3855 | 20 34 30.4 | 12.300 |
| 20 | 7 0 20.13 | 2.7769 | 27 34 46.1 | 4.821 | 20 | 9 4 35.78 | 2.3765 | 20 22 9.1 | 12.409 |
| 21 | 7 3 6.57 | 2.7710 | 27 29 50.7 | 5.025 | 21 | 9 6 58.10 | 2.3675 | 20 9 41.3 | 12.516 |
| 22 | 7 5 52.65 | 2.7649 | 27 24 43.1 | 5.228 | 22 | 9 9 19.88 | 2.3585 | 19 57 7.2 | 12.619 |
| 23 | 7 8 38.36 | 2.7586 | N.27 19 23.4 | 5.428 | 23 | 9 11 41.12 | 2.3496 | N.19 44 27.0 | 12.721 |
| | FRIDAY 26. | | | | | SUNDAY 28. | | | |
| 0 | 7 11 23.68 | 2.7521 | N.27 13 51.8 | 5.626 | 0 | 9 14 1.83 | 2.3408 | N.19 31 40.7 | 12.821 |
| 1 | 7 14 8.61 | 2.7454 | 27 8 8.3 | 5.823 | 1 | 9 16 22.02 | 2.3321 | 19 18 48.5 | 12.918 |
| 2 | 7 16 53.13 | 2.7386 | 27 2 13.0 | 6.019 | 2 | 9 18 41.69 | 2.3234 | 19 5 50.5 | 13.015 |
| 3 | 7 19 37.24 | 2.7317 | 26 56 6.0 | 6.213 | 3 | 9 21 0.83 | 2.3147 | 18 52 46.7 | 13.109 |
| 4 | 7 22 20.93 | 2.7245 | 26 49 47.4 | 6.405 | 4 | 9 23 19.45 | 2.3061 | 18 39 37.4 | 13.201 |
| 5 | 7 25 4.18 | 2.7173 | 26 43 17.4 | 6.594 | 5 | 9 25 37.56 | 2.2976 | 18 26 22.6 | 13.291 |
| 6 | 7 27 47.00 | 2.7099 | 26 36 36.1 | 6.783 | 6 | 9 27 55.16 | 2.2891 | 18 13 2.5 | 13.378 |
| 7 | 7 30 29.37 | 2.7023 | 26 29 43.5 | 6.970 | 7 | 9 30 12.25 | 2.2807 | 17 59 37.2 | 13.464 |
| 8 | 7 33 11.28 | 2.6947 | 26 22 39.7 | 7.155 | 8 | 9 32 28.84 | 2.2723 | 17 46 6.8 | 13.548 |
| 9 | 7 35 52.73 | 2.6869 | 26 15 24.9 | 7.337 | 9 | 9 34 44.93 | 2.2640 | 17 32 31.4 | 13.630 |
| 10 | 7 38 33.71 | 2.6790 | 26 7 59.2 | 7.518 | 10 | 9 37 0.52 | 2.2558 | 17 18 51.2 | 13.710 |
| 11 | 7 41 14.21 | 2.6709 | 26 0 22.7 | 7.697 | 11 | 9 39 15.62 | 2.2477 | 17 5 6.2 | 13.789 |
| 12 | 7 43 54.22 | 2.6628 | 25 52 35.5 | 7.874 | 12 | 9 41 30.24 | 2.2397 | 16 51 16.5 | 13.866 |
| 13 | 7 46 33.74 | 2.6546 | 25 44 37.8 | 8.048 | 13 | 9 43 44.38 | 2.2317 | 16 37 22.3 | 13.940 |
| 14 | 7 49 12.77 | 2.6463 | 25 36 29.7 | 8.222 | 14 | 9 45 58.04 | 2.2237 | 16 23 23.7 | 14.012 |
| 15 | 7 51 51.30 | 2.6379 | 25 28 11.2 | 8.393 | 15 | 9 48 11.22 | 2.2158 | 16 9 20.8 | 14.082 |
| 16 | 7 54 29.32 | 2.6294 | 25 19 42.5 | 8.562 | 16 | 9 50 23.93 | 2.2080 | 15 55 13.8 | 14.151 |
| 17 | 7 57 6.83 | 2.6208 | 25 11 3.8 | 8.728 | 17 | 9 52 36.18 | 2.2004 | 15 41 2.7 | 14.218 |
| 18 | 7 59 43.82 | 2.6122 | 25 2 15.2 | 8.892 | 18 | 9 54 47.98 | 2.1928 | 15 26 47.6 | 14.284 |
| 19 | 8 2 20.29 | 2.6034 | 24 53 16.8 | 9.054 | 19 | 9 56 59.32 | 2.1853 | 15 12 28.6 | 14.347 |
| 20 | 8 4 56.23 | 2.5946 | 24 44 8.7 | 9.215 | 20 | 9 59 10.21 | 2.1779 | 14 58 5.9 | 14.409 |
| 21 | 8 7 31.64 | 2.5857 | 24 34 51.0 | 9.373 | 21 | 10 1 20.66 | 2.1706 | 14 43 39.5 | 14.470 |
| 22 | 8 10 6.52 | 2.5769 | 24 25 23.9 | 9.528 | 22 | 10 3 30.68 | 2.1633 | 14 29 9.5 | 14.528 |
| 23 | 8 12 40.87 | 2.5680 | 24 15 47.6 | 9.682 | 23 | 10 5 40.26 | 2.1561 | 14 14 36.1 | 14.585 |
| 24 | 8 15 14.68 | 2.5589 | N.24 6 2.1 | 9.834 | 24 | 10 7 49.41 | 2.1490 | N.13 59 59.3 | 14.640 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### MONDAY 29.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 10 7 49.41 | 2.1490 | N.13 59 59.3 | 14.640 |
| 1 | 10 9 58.14 | 2.1421 | 13 45 19.3 | 14.693 |
| 2 | 10 12 6.46 | 2.1352 | 13 30 36.1 | 14.745 |
| 3 | 10 14 14.37 | 2.1284 | 13 15 49.9 | 14.795 |
| 4 | 10 16 21.87 | 2.1216 | 13 1 0.7 | 14.844 |
| 5 | 10 18 28.96 | 2.1148 | 12 46 8.6 | 14.891 |
| 6 | 10 20 35.65 | 2.1083 | 12 31 13.8 | 14.936 |
| 7 | 10 22 41.96 | 2.1020 | 12 16 16.3 | 14.980 |
| 8 | 10 24 47.89 | 2.0957 | 12 1 16.2 | 15.022 |
| 9 | 10 26 53.44 | 2.0894 | 11 46 13.7 | 15.062 |
| 10 | 10 28 58.62 | 2.0832 | 11 31 8.8 | 15.101 |
| 11 | 10 31 3.43 | 2.0772 | 11 16 1.6 | 15.139 |
| 12 | 10 33 7.88 | 2.0712 | 11 0 52.1 | 15.176 |
| 13 | 10 35 11.98 | 2.0654 | 10 45 40.5 | 15.210 |
| 14 | 10 37 15.73 | 2.0596 | 10 30 26.9 | 15.243 |
| 15 | 10 39 19.13 | 2.0539 | 10 15 11.3 | 15.276 |
| 16 | 10 41 22.20 | 2.0484 | 9 59 53.8 | 15.306 |
| 17 | 10 43 24.94 | 2.0429 | 9 44 34.6 | 15.334 |
| 18 | 10 45 27.35 | 2.0375 | 9 29 13.7 | 15.362 |
| 19 | 10 47 29.44 | 2.0322 | 9 13 51.1 | 15.389 |
| 20 | 10 49 31.22 | 2.0271 | 8 58 27.0 | 15.413 |
| 21 | 10 51 32.69 | 2.0220 | 8 43 1.5 | 15.437 |
| 22 | 10 53 33.86 | 2.0170 | 8 27 34.6 | 15.459 |
| 23 | 10 55 34.73 | 2.0121 | N. 8 12 6.4 | 15.481 |

### TUESDAY 30.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 10 57 35.31 | 2.0073 | N. 7 56 36.9 | 15.501 |
| 1 | 10 59 35.61 | 2.0027 | 7 41 6.3 | 15.518 |
| 2 | 11 1 35.63 | 1.9980 | 7 25 34.7 | 15.535 |
| 3 | 11 3 35.37 | 1.9935 | 7 10 2.1 | 15.551 |
| 4 | 11 5 34.85 | 1.9891 | 6 54 28.6 | 15.566 |
| 5 | 11 7 34.07 | 1.9848 | 6 38 54.2 | 15.579 |
| 6 | 11 9 33.03 | 1.9806 | 6 23 19.1 | 15.591 |
| 7 | 11 11 31.74 | 1.9765 | 6 7 43.3 | 15.602 |
| 8 | 11 13 30.21 | 1.9725 | 5 52 6.9 | 15.612 |
| 9 | 11 15 28.44 | 1.9686 | 5 36 29.9 | 15.620 |
| 10 | 11 17 26.44 | 1.9648 | 5 20 52.5 | 15.627 |
| 11 | 11 19 24.22 | 1.9611 | 5 5 14.7 | 15.633 |
| 12 | 11 21 21.77 | 1.9574 | 4 49 36.5 | 15.638 |
| 13 | 11 23 19.11 | 1.9539 | 4 33 58.1 | 15.642 |
| 14 | 11 25 16.24 | 1.9504 | 4 18 19.5 | 15.645 |
| 15 | 11 27 13.16 | 1.9471 | 4 2 40.7 | 15.647 |
| 16 | 11 29 9.89 | 1.9439 | 3 47 1.9 | 15.647 |
| 17 | 11 31 6.43 | 1.9408 | 3 31 23.1 | 15.646 |
| 18 | 11 33 2.78 | 1.9377 | 3 15 44.4 | 15.644 |
| 19 | 11 34 58.95 | 1.9347 | 3 0 5.8 | 15.642 |
| 20 | 11 36 54.94 | 1.9319 | 2 44 27.4 | 15.638 |
| 21 | 11 38 50.77 | 1.9292 | 2 28 49.3 | 15.633 |
| 22 | 11 40 46.44 | 1.9265 | 2 13 11.5 | 15.627 |
| 23 | 11 42 41.95 | 1.9238 | 1 57 34.1 | 15.619 |
| 24 | 11 44 37.30 | 1.9213 | N. 1 41 57.2 | 15.611 |

### WEDNESDAY 31.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 11 44 37.30 | 1.9213 | N. 1 41 57.2 | 15.611 |
| 1 | 11 46 32.51 | 1.9189 | 1 26 20.8 | 15.602 |
| 2 | 11 48 27.57 | 1.9166 | 1 10 45.0 | 15.592 |
| 3 | 11 50 22.50 | 1.9144 | 0 55 9.8 | 15.581 |
| 4 | 11 52 17.30 | 1.9123 | 0 39 35.3 | 15.568 |
| 5 | 11 54 11.98 | 1.9103 | 0 24 1.6 | 15.555 |
| 6 | 11 56 6.54 | 1.9083 | N. 0 8 28.7 | 15.541 |
| 7 | 11 58 0.98 | 1.9064 | S. 0 7 3.3 | 15.526 |
| 8 | 11 59 55.31 | 1.9047 | 0 22 34.4 | 15.510 |
| 9 | 12 1 49.54 | 1.9030 | 0 38 4.5 | 15.492 |
| 10 | 12 3 43.67 | 1.9014 | 0 53 33.5 | 15.474 |
| 11 | 12 5 37.71 | 1.8999 | 1 9 1.4 | 15.456 |
| 12 | 12 7 31.66 | 1.8985 | 1 24 28.2 | 15.436 |
| 13 | 12 9 25.53 | 1.8972 | 1 39 53.7 | 15.414 |
| 14 | 12 11 19.33 | 1.8960 | 1 55 17.9 | 15.392 |
| 15 | 12 13 13.05 | 1.8948 | 2 10 40.8 | 15.370 |
| 16 | 12 15 6.70 | 1.8937 | 2 26 2.3 | 15.346 |
| 17 | 12 17 0.29 | 1.8927 | 2 41 22.3 | 15.321 |
| 18 | 12 18 53.83 | 1.8918 | 2 56 40.8 | 15.295 |
| 19 | 12 20 47.31 | 1.8910 | 3 11 57.7 | 15.269 |
| 20 | 12 22 40.75 | 1.8903 | 3 27 13.0 | 15.242 |
| 21 | 12 24 34.15 | 1.8897 | 3 42 26.7 | 15.213 |
| 22 | 12 26 27.52 | 1.8892 | 3 57 38.6 | 15.183 |
| 23 | 12 28 20.85 | 1.8886 | S. 4 12 48.7 | 15.153 |

### THURSDAY, JUNE 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 12 30 14.15 | 1.8882 | S. 4 27 57.0 | 15.122 |

### PHASES OF THE MOON.

| | | d | h | m |
|---|---|---|---|---|
| ○ | Full Moon, | 7 | 21 | 52.9 |
| ☾ | Last Quarter, | 16 | 1 | 26.8 |
| ● | New Moon, | 23 | 3 | 25.3 |
| ☽ | First Quarter, | 29 | 17 | 48.6 |

| | | d | h |
|---|---|---|---|
| ☾ | Apogee, | 11 | 23.4 |
| ☾ | Perigee, | 24 | 7.2 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | |
| 1 | Sun | W. | 97 15 21 | 2744 | 98 51 3 | 2755 | 100 26 30 | 2766 | 102 1 42 | 2777 |
| | Mars | W. | 65 10 53 | 2647 | 66 48 44 | 2658 | 68 26 20 | 2669 | 70 3 42 | 2679 |
| | Venus | W. | 51 47 14 | 2747 | 53 22 52 | 2757 | 54 58 16 | 2768 | 56 33 26 | 2779 |
| | Pollux | W. | 27 17 4 | 2429 | 28 59 58 | 2438 | 30 42 38 | 2447 | 32 25 6 | 2457 |
| | Spica | E. | 63 37 41 | 2417 | 61 54 31 | 2428 | 60 11 36 | 2438 | 58 28 56 | 2448 |
| | Jupiter | E. | 100 21 46 | 2403 | 98 38 15 | 2412 | 96 54 58 | 2423 | 95 11 56 | 2433 |
| | Antares | E. | 109 31 53 | 2418 | 107 48 44 | 2428 | 106 5 49 | 2438 | 104 23 9 | 2449 |
| 2 | Sun | W. | 109 54 2 | 2834 | 111 27 46 | 2845 | 113 1 16 | 2855 | 114 34 32 | 2867 |
| | Mars | W. | 78 7 0 | 2732 | 79 42 57 | 2742 | 81 18 41 | 2753 | 82 54 11 | 2763 |
| | Venus | W. | 64 25 44 | 2832 | 65 59 30 | 2842 | 67 33 3 | 2853 | 69 6 22 | 2863 |
| | Pollux | W. | 40 53 59 | 2505 | 42 35 5 | 2515 | 44 15 57 | 2525 | 45 56 35 | 2535 |
| | Spica | E. | 49 59 14 | 2500 | 48 18 1 | 2510 | 46 37 2 | 2520 | 44 56 17 | 2530 |
| | Jupiter | E. | 86 40 19 | 2483 | 84 58 42 | 2493 | 83 17 19 | 2504 | 81 36 11 | 2513 |
| | Antares | E. | 95 53 28 | 2500 | 94 12 14 | 2510 | 92 31 15 | 2520 | 90 50 30 | 2530 |
| 3 | Sun | W. | 122 17 16 | 2922 | 123 49 7 | 2933 | 125 20 44 | 2943 | 126 52 8 | 2954 |
| | Mars | W. | 90 48 16 | 2814 | 92 22 25 | 2824 | 93 56 21 | 2835 | 95 30 3 | 2845 |
| | Venus | W. | 76 49 40 | 2914 | 78 21 41 | 2924 | 79 53 29 | 2935 | 81 25 4 | 2944 |
| | Pollux | W. | 54 16 26 | 2583 | 55 55 45 | 2592 | 57 34 51 | 2602 | 59 13 44 | 2611 |
| | Spica | E. | 36 35 56 | 2579 | 34 56 33 | 2588 | 33 17 22 | 2598 | 31 38 24 | 2607 |
| | Jupiter | E. | 73 13 56 | 2563 | 71 34 10 | 2573 | 69 54 38 | 2583 | 68 15 19 | 2593 |
| | Antares | E. | 82 30 10 | 2579 | 80 50 46 | 2589 | 79 11 36 | 2599 | 77 32 39 | 2607 |
| 4 | Venus | W. | 88 59 57 | 2993 | 90 30 19 | 3002 | 92 0 30 | 3011 | 93 30 29 | 3021 |
| | Pollux | W. | 67 25 0 | 2657 | 69 2 38 | 2666 | 70 40 4 | 2675 | 72 17 18 | 2684 |
| | Regulus | W. | 30 38 51 | 2664 | 32 16 19 | 2673 | 33 53 35 | 2681 | 35 30 40 | 2689 |
| | Jupiter | E. | 60 2 8 | 2642 | 58 24 10 | 2652 | 56 46 26 | 2662 | 55 8 55 | 2672 |
| | Antares | E. | 69 21 2 | 2654 | 67 43 20 | 2663 | 66 5 51 | 2672 | 64 28 33 | 2681 |
| 5 | Venus | W. | 100 57 32 | 3066 | 102 26 23 | 3075 | 103 55 3 | 3084 | 105 23 32 | 3093 |
| | Pollux | W. | 80 20 30 | 2727 | 81 56 34 | 2736 | 83 32 26 | 2744 | 85 8 7 | 2753 |
| | Regulus | W. | 43 33 20 | 2731 | 45 9 19 | 2739 | 46 45 7 | 2747 | 48 20 44 | 2756 |
| | Jupiter | E. | 47 4 42 | 2723 | 45 28 33 | 2734 | 43 52 38 | 2744 | 42 16 57 | 2756 |
| | Antares | E. | 56 25 4 | 2725 | 54 48 57 | 2734 | 53 13 2 | 2742 | 51 37 18 | 2750 |
| | α Aquilæ | E. | 106 34 34 | 3600 | 105 16 0 | 3595 | 103 57 20 | 3592 | 102 38 37 | 3589 |
| 6 | Pollux | W. | 93 3 43 | 2795 | 94 38 17 | 2803 | 96 12 41 | 2811 | 97 46 54 | 2820 |
| | Regulus | W. | 56 16 6 | 2797 | 57 50 38 | 2805 | 59 25 0 | 2813 | 60 59 11 | 2821 |
| | Jupiter | E. | 34 22 24 | 2818 | 32 48 19 | 2832 | 31 14 33 | 2847 | 29 41 6 | 2863 |
| | Antares | E. | 43 41 25 | 2793 | 42 6 48 | 2801 | 40 32 21 | 2809 | 38 58 5 | 2817 |
| | α Aquilæ | E. | 96 4 51 | 3597 | 94 46 13 | 3600 | 93 27 39 | 3606 | 92 9 11 | 3612 |
| 7 | Pollux | W. | 105 35 20 | 2860 | 107 8 30 | 2868 | 108 41 30 | 2876 | 110 14 20 | 2884 |
| | Regulus | W. | 68 47 32 | 2860 | 70 20 42 | 2869 | 71 53 41 | 2876 | 73 26 30 | 2884 |
| | Antares | E. | 31 9 22 | 2858 | 29 36 9 | 2866 | 28 3 6 | 2873 | 26 30 13 | 2881 |
| | α Aquilæ | E. | 85 38 57 | 3659 | 84 21 26 | 3671 | 83 4 8 | 3684 | 81 47 4 | 3698 |
| 8 | Regulus | W. | 81 8 9 | 2922 | 82 40 0 | 2929 | 84 11 42 | 2936 | 85 43 15 | 2943 |
| | Spica | W. | 27 6 5 | 2919 | 28 38 0 | 2926 | 30 9 46 | 2933 | 31 41 23 | 2941 |
| | α Aquilæ | E. | 75 25 49 | 3785 | 74 10 31 | 3805 | 72 55 34 | 3826 | 71 40 59 | 3850 |
| | Fomalhaut | E. | 100 33 11 | 3165 | 99 6 20 | 3171 | 97 39 36 | 3176 | 96 12 58 | 3182 |
| | Saturn | E. | 107 24 57 | 2941 | 105 53 30 | 2949 | 104 22 13 | 2956 | 102 51 5 | 2962 |
| 9 | Regulus | W. | 93 18 47 | 2977 | 94 49 28 | 2985 | 96 20 0 | 2990 | 97 50 25 | 2997 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XV$^{\text{h}}$. | P. L. of Diff. | XVIII$^{\text{h}}$. | P. L. of Diff. | XXI$^{\text{h}}$. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun | W. | 103° 36′ 40″ | 2789 | 105° 11′ 22″ | 2800 | 106° 45′ 50″ | 2811 | 108° 20′ 3″ | 2822 |
| | Mars | W. | 71 40 50 | 2689 | 73 17 44 | 2700 | 74 54 24 | 2711 | 76 30 49 | 2722 |
| | Venus | W. | 58 8 21 | 2790 | 59 43 2 | 2800 | 61 17 30 | 2811 | 62 51 44 | 2821 |
| | Pollux | W. | 34 7 20 | 2467 | 35 49 20 | 2476 | 37 31 7 | 2486 | 39 12 40 | 2496 |
| | Spica | E. | 56 46 30 | 2459 | 55 4 19 | 2470 | 53 22 23 | 2480 | 51 40 41 | 2490 |
| | Jupiter | E. | 93 29 8 | 2443 | 91 46 34 | 2453 | 90 4 15 | 2463 | 88 22 10 | 2473 |
| | Antares | E. | 102 40 44 | 2459 | 100 58 33 | 2470 | 99 16 37 | 2480 | 97 34 55 | 2490 |
| 2 | Sun | W. | 116 7 33 | 2878 | 117 40 20 | 2889 | 119 12 53 | 2901 | 120 45 11 | 2911 |
| | Mars | W. | 84 29 27 | 2774 | 86 4 29 | 2784 | 87 39 18 | 2794 | 89 13 54 | 2804 |
| | Venus | W. | 70 39 28 | 2873 | 72 12 21 | 2884 | 73 45 0 | 2894 | 75 17 26 | 2904 |
| | Pollux | W. | 47 37 0 | 2544 | 49 17 12 | 2554 | 50 57 10 | 2564 | 52 36 55 | 2574 |
| | Spica | E. | 43 15 45 | 2540 | 41 35 27 | 2550 | 39 55 23 | 2560 | 38 15 33 | 2569 |
| | Jupiter | E. | 79 55 16 | 2523 | 78 14 35 | 2533 | 76 34 8 | 2543 | 74 53 55 | 2553 |
| | Antares | E. | 89 9 59 | 2540 | 87 29 41 | 2550 | 85 49 37 | 2560 | 84 9 47 | 2569 |
| 3 | Sun | W. | 128 23 18 | 2965 | 129 54 14 | 2977 | 131 24 56 | 2987 | 132 55 25 | 2998 |
| | Mars | W. | 97 3 33 | 2855 | 98 36 50 | 2865 | 100 9 54 | 2874 | 101 42 46 | 2884 |
| | Venus | W. | 82 56 27 | 2954 | 84 27 38 | 2964 | 85 58 36 | 2973 | 87 29 22 | 2982 |
| | Pollux | W. | 60 52 24 | 2620 | 62 30 52 | 2629 | 64 9 7 | 2638 | 65 47 10 | 2648 |
| | Spica | E. | 29 59 39 | 2617 | 28 21 7 | 2626 | 26 42 48 | 2635 | 25 4 41 | 2645 |
| | Jupiter | E. | 66 36 14 | 2602 | 64 57 22 | 2613 | 63 18 44 | 2622 | 61 40 19 | 2632 |
| | Antares | E. | 75 53 54 | 2617 | 74 15 22 | 2627 | 72 37 3 | 2635 | 70 58 56 | 2645 |
| 4 | Venus | W. | 95 0 16 | 3030 | 96 29 52 | 3039 | 97 59 17 | 3048 | 99 28 30 | 3057 |
| | Pollux | W. | 73 54 20 | 2693 | 75 31 10 | 2702 | 77 7 48 | 2710 | 78 44 15 | 2719 |
| | Regulus | W. | 37 7 34 | 2698 | 38 44 17 | 2706 | 40 20 49 | 2714 | 41 57 10 | 2722 |
| | Jupiter | E. | 53 31 37 | 2682 | 51 54 33 | 2692 | 50 17 42 | 2702 | 48 41 5 | 2713 |
| | Antares | E. | 62 51 28 | 2690 | 61 14 35 | 2699 | 59 37 53 | 2708 | 58 1 23 | 2716 |
| 5 | Venus | W. | 106 51 50 | 3102 | 108 19 57 | 3110 | 109 47 54 | 3119 | 111 15 40 | 3128 |
| | Pollux | W. | 86 43 36 | 2761 | 88 18 55 | 2770 | 89 54 2 | 2779 | 91 28 58 | 2787 |
| | Regulus | W. | 49 56 10 | 2764 | 51 31 25 | 2772 | 53 6 30 | 2781 | 54 41 23 | 2788 |
| | Jupiter | E. | 40 41 31 | 2767 | 39 6 20 | 2779 | 37 31 25 | 2792 | 35 56 46 | 2805 |
| | Antares | E. | 50 1 45 | 2759 | 48 26 23 | 2768 | 46 51 13 | 2776 | 45 16 13 | 2785 |
| | α Aquilæ | E. | 101 19 51 | 3588 | 100 1 4 | 3589 | 98 42 18 | 3590 | 97 23 33 | 3593 |
| 6 | Pollux | W. | 99 20 56 | 2828 | 100 54 48 | 2836 | 102 28 29 | 2844 | 104 2 0 | 2852 |
| | Regulus | W. | 62 33 12 | 2828 | 64 7 3 | 2837 | 65 40 43 | 2845 | 67 14 13 | 2853 |
| | Jupiter | E. | 28 7 59 | 2880 | 26 35 15 | 2900 | 25 2 56 | 2922 | 23 31 5 | 2946 |
| | Antares | E. | 37 23 59 | 2825 | 35 50 4 | 2834 | 34 16 20 | 2842 | 32 42 46 | 2849 |
| | α Aquilæ | E. | 90 50 50 | 3620 | 89 32 37 | 3629 | 88 14 34 | 3637 | 86 56 40 | 3648 |
| 7 | Pollux | W. | 111 46 59 | 2892 | 113 19 28 | 2899 | 114 51 48 | 2907 | 116 23 58 | 2915 |
| | Regulus | W. | 74 59 9 | 2892 | 76 31 38 | 2899 | 78 3 58 | 2907 | 79 36 8 | 2914 |
| | Antares | E. | 24 57 30 | 2889 | 23 24 57 | 2897 | 21 52 34 | 2904 | 20 20 20 | 2912 |
| | α Aquilæ | E. | 80 30 15 | 3713 | 79 13 42 | 3729 | 77 57 26 | 3746 | 76 41 28 | 3765 |
| 8 | Regulus | W. | 87 14 39 | 2950 | 88 45 54 | 2958 | 90 17 0 | 2964 | 91 47 58 | 2971 |
| | Spica | W. | 33 12 50 | 2948 | 34 44 8 | 2954 | 36 15 18 | 2961 | 37 46 19 | 2968 |
| | α Aquilæ | E. | 70 26 48 | 3874 | 69 13 2 | 3900 | 67 59 42 | 3926 | 66 46 49 | 3956 |
| | Fomalhaut | E. | 94 46 27 | 3188 | 93 20 3 | 3194 | 91 53 47 | 3201 | 90 27 39 | 3207 |
| | Saturn | E. | 101 20 5 | 2970 | 99 49 15 | 2977 | 98 18 33 | 2984 | 96 48 0 | 2990 |
| 9 | Regulus | W. | 99 20 42 | 3003 | 100 50 51 | 3009 | 102 20 53 | 3014 | 103 50 48 | 3020 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Spica | W. | 39° 17′ 12″ | 2975 | 40° 47′ 56″ | 2981 | 42° 18′ 32″ | 2988 | 43° 49′ 0″ | 2993 |
| | α Aquilæ | E. | 65 34 26 | 3966 | 64 22 33 | 4020 | 63 11 13 | 4054 | 62 0 27 | 4090 |
| | Fomalhaut | E. | 89 1 38 | 3214 | 87 35 45 | 3221 | 86 10 1 | 3229 | 84 44 26 | 3236 |
| | Saturn | E. | 95 17 35 | 2997 | 93 47 18 | 3004 | 92 17 10 | 3009 | 90 47 9 | 3016 |
| | α Pegasi | E. | 110 42 19 | 3250 | 109 17 44 | 3260 | 107 53 9 | 3282 | 106 28 36 | 3282 |
| 10 | Regulus | W. | 105 20 36 | 3025 | 106 50 18 | 3030 | 108 19 53 | 3035 | 109 49 22 | 3040 |
| | Spica | W. | 51 19 30 | 3022 | 52 49 15 | 3027 | 54 18 54 | 3033 | 55 48 26 | 3037 |
| | α Aquilæ | E. | 56 16 9 | 4313 | 55 9 28 | 4365 | 54 3 35 | 4422 | 52 58 34 | 4484 |
| | Fomalhaut | E. | 77 38 44 | 3276 | 76 14 4 | 3284 | 74 49 34 | 3293 | 73 25 14 | 3301 |
| | Saturn | E. | 83 18 56 | 3044 | 81 49 38 | 3049 | 80 20 26 | 3054 | 78 51 20 | 3059 |
| | α Pegasi | E. | 99 26 24 | 3295 | 98 2 7 | 3299 | 96 37 54 | 3301 | 95 13 44 | 3305 |
| 11 | Spica | W. | 63 14 48 | 3056 | 64 43 51 | 3060 | 66 12 49 | 3063 | 67 41 44 | 3066 |
| | Jupiter | W. | 28 10 1 | 3099 | 29 38 12 | 3095 | 31 6 28 | 3091 | 32 34 49 | 3087 |
| | α Aquilæ | E. | 47 48 14 | 4866 | 46 49 32 | 4962 | 45 52 7 | 5067 | 44 56 4 | 5181 |
| | Fomalhaut | E. | 66 26 12 | 3349 | 65 2 57 | 3359 | 63 39 54 | 3371 | 62 17 4 | 3381 |
| | Saturn | E. | 71 27 11 | 3078 | 69 58 35 | 3082 | 68 30 3 | 3084 | 67 1 34 | 3087 |
| | α Pegasi | E. | 88 13 56 | 3323 | 86 50 11 | 3327 | 85 26 31 | 3332 | 84 2 56 | 3335 |
| 12 | Spica | W. | 75 5 35 | 3074 | 76 34 16 | 3075 | 78 2 56 | 3076 | 79 31 35 | 3076 |
| | Jupiter | W. | 39 57 23 | 3077 | 41 26 1 | 3074 | 42 54 42 | 3072 | 44 23 26 | 3070 |
| | Antares | W. | 29 11 21 | 3075 | 30 40 1 | 3075 | 32 8 41 | 3076 | 33 37 20 | 3076 |
| | Fomalhaut | E. | 55 26 14 | 3446 | 54 4 49 | 3460 | 52 43 40 | 3476 | 51 22 49 | 3494 |
| | Saturn | E. | 59 39 53 | 3096 | 58 11 38 | 3096 | 56 43 24 | 3096 | 55 15 10 | 3097 |
| | α Pegasi | E. | 77 6 11 | 3357 | 75 43 5 | 3361 | 74 20 4 | 3365 | 72 57 8 | 3371 |
| | Sun | E. | 134 30 21 | 3465 | 133 9 18 | 3465 | 131 48 15 | 3464 | 130 27 11 | 3464 |
| 13 | Spica | W. | 86 54 58 | 3070 | 88 23 44 | 3069 | 89 52 32 | 3066 | 91 21 23 | 3063 |
| | Jupiter | W. | 51 47 47 | 3056 | 53 16 50 | 3053 | 54 45 57 | 3050 | 56 15 8 | 3045 |
| | Antares | W. | 41 0 43 | 3071 | 42 29 28 | 3069 | 43 58 16 | 3066 | 45 27 7 | 3063 |
| | Fomalhaut | E. | 44 43 50 | 3601 | 43 25 17 | 3628 | 42 7 13 | 3659 | 40 49 42 | 3693 |
| | Saturn | E. | 47 53 53 | 3091 | 46 25 33 | 3089 | 44 57 10 | 3086 | 43 28 43 | 3083 |
| | α Pegasi | E. | 66 3 52 | 3396 | 64 41 31 | 3401 | 63 19 16 | 3408 | 61 57 8 | 3415 |
| | Sun | E. | 123 41 35 | 3456 | 122 20 22 | 3453 | 120 59 5 | 3449 | 119 37 44 | 3446 |
| 14 | Spica | W. | 98 46 46 | 3042 | 100 16 7 | 3035 | 101 45 36 | 3030 | 103 15 12 | 3023 |
| | Jupiter | W. | 63 42 30 | 3020 | 65 12 18 | 3014 | 66 42 13 | 3007 | 68 12 17 | 3001 |
| | Antares | W. | 52 52 30 | 3041 | 54 21 52 | 3036 | 55 51 20 | 3030 | 57 20 56 | 3024 |
| | Saturn | E. | 36 5 24 | 3061 | 34 36 27 | 3056 | 33 7 23 | 3050 | 31 38 12 | 3043 |
| | α Pegasi | E. | 55 8 32 | 3455 | 53 47 18 | 3465 | 52 26 15 | 3477 | 51 5 25 | 3490 |
| | Sun | E. | 112 49 54 | 3422 | 111 28 2 | 3415 | 110 6 3 | 3409 | 108 43 57 | 3401 |
| 15 | Spica | W. | 110 45 22 | 2985 | 112 15 54 | 2975 | 113 46 38 | 2966 | 115 17 33 | 2956 |
| | Jupiter | W. | 75 44 53 | 2960 | 77 15 56 | 2951 | 78 47 10 | 2342 | 80 18 36 | 2931 |
| | Antares | W. | 64 51 4 | 2985 | 66 21 36 | 2975 | 67 52 20 | 2966 | 69 23 15 | 2956 |
| | α Aquilæ | W. | 35 9 8 | 8244 | 35 36 6 | 7774 | 36 6 9 | 7368 | 36 39 9 | 7008 |
| | Sun | E. | 101 51 10 | 3358 | 100 28 6 | 3349 | 99 4 51 | 3338 | 97 41 24 | 3328 |
| 16 | Jupiter | W. | 87 59 10 | 2875 | 89 32 1 | 2863 | 91 5 8 | 2850 | 92 38 31 | 2837 |
| | Antares | W. | 77 1 11 | 2900 | 78 33 30 | 2887 | 80 6 5 | 2874 | 81 38 57 | 2861 |
| | α Aquilæ | W. | 40 4 42 | 5701 | 40 53 8 | 5508 | 41 43 46 | 5333 | 42 36 29 | 5172 |
| | Sun | E. | 90 40 51 | 3266 | 89 16 0 | 3253 | 87 50 54 | 3239 | 86 25 31 | 3225 |
| 17 | Jupiter | W. | 100 29 51 | 2766 | 102 5 3 | 2751 | 103 40 35 | 2735 | 105 16 28 | 2790 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Spica | W. | 45° 19′ 21″ | 3000 | 46° 49′ 34″ | 3006 | 48° 19′ 40″ | 3012 | 49° 49′ 38″ | 3017 |
| | α Aquilæ | E. | 60 50 16 | 4130 | 59 40 43 | 4171 | 58 31 49 | 4215 | 57 23 37 | 4262 |
| | Fomalhaut | E. | 83 18 59 | 3243 | 81 53 41 | 3252 | 80 28 33 | 3259 | 79 3 34 | 3267 |
| | Saturn | E. | 89 17 16 | 3022 | 87 47 30 | 3028 | 86 17 52 | 3034 | 84 48 21 | 3039 |
| | α Pegasi | E. | 105 4 4 | 3285 | 103 39 35 | 3287 | 102 15 8 | 3289 | 100 50 44 | 3293 |
| 10 | Regulus | W. | 111 18 45 | 3044 | 112 48 3 | 3049 | 114 17 15 | 3053 | 115 46 22 | 3057 |
| | Spica | W. | 57 17 53 | 3042 | 58 47 14 | 3046 | 60 16 30 | 3050 | 61 45 41 | 3053 |
| | α Aquilæ | E. | 51 54 28 | 4550 | 50 51 20 | 4619 | 49 49 12 | 4696 | 48 48 9 | 4777 |
| | Fomalhaut | E. | 72 1 4 | 3311 | 70 37 5 | 3319 | 69 13 16 | 3329 | 67 49 38 | 3339 |
| | Saturn | E. | 77 22 20 | 3063 | 75 53 25 | 3068 | 74 24 36 | 3071 | 72 55 51 | 3075 |
| | α Pegasi | E. | 93 49 38 | 3309 | 92 25 37 | 3312 | 91 1 39 | 3315 | 89 37 45 | 3319 |
| 11 | Spica | W. | 69 10 35 | 3069 | 70 39 23 | 3070 | 72 8 9 | 3072 | 73 36 53 | 3073 |
| | Jupiter | W. | 34 3 14 | 3085 | 35 31 42 | 3083 | 37 0 13 | 3080 | 38 28 47 | 3078 |
| | α Aquilæ | E. | 44 1 28 | 5303 | 43 8 23 | 5439 | 42 16 56 | 5586 | 41 27 12 | 5749 |
| | Fomalhaut | E. | 60 54 26 | 3393 | 59 32 2 | 3405 | 58 9 51 | 3418 | 56 47 55 | 3431 |
| | Saturn | E. | 65 33 9 | 3090 | 64 4 47 | 3091 | 62 36 27 | 3093 | 61 8 9 | 3095 |
| | α Pegasi | E. | 82 39 25 | 3339 | 81 15 59 | 3344 | 79 52 38 | 3348 | 78 29 22 | 3352 |
| 12 | Spica | W. | 81 0 14 | 3075 | 82 28 54 | 3075 | 83 57 34 | 3074 | 85 26 15 | 3073 |
| | Jupiter | W. | 45 52 12 | 3068 | 47 21 1 | 3065 | 48 49 53 | 3063 | 50 18 48 | 3060 |
| | Antares | W. | 35 5 59 | 3075 | 36 34 39 | 3075 | 38 3 19 | 3074 | 39 32 0 | 3073 |
| | Fomalhaut | E. | 50 2 18 | 3512 | 48 42 7 | 3531 | 47 22 17 | 3553 | 46 2 51 | 3576 |
| | Saturn | E. | 53 46 57 | 3096 | 52 18 43 | 3096 | 50 50 28 | 3094 | 49 22 11 | 3093 |
| | α Pegasi | E. | 71 34 18 | 3375 | 70 11 33 | 3379 | 68 48 53 | 3385 | 67 26 19 | 3391 |
| | Sun | E. | 129 6 7 | 3463 | 127 45 2 | 3462 | 126 23 55 | 3460 | 125 2 46 | 3458 |
| 13 | Spica | W. | 92 50 18 | 3059 | 94 19 18 | 3056 | 95 48 22 | 3052 | 97 17 31 | 3047 |
| | Jupiter | W. | 57 44 25 | 3041 | 59 13 47 | 3036 | 60 43 15 | 3031 | 62 12 49 | 3026 |
| | Antares | W. | 46 56 2 | 3060 | 48 25 1 | 3056 | 49 54 5 | 3051 | 51 23 15 | 3047 |
| | Fomalhaut | E. | 39 32 47 | 3730 | 38 16 32 | 3772 | 37 1 1 | 3820 | 35 46 19 | 3872 |
| | Saturn | E. | 42 0 13 | 3079 | 40 31 38 | 3076 | 39 2 59 | 3071 | 37 34 14 | 3067 |
| | α Pegasi | E. | 60 35 8 | 3422 | 59 13 16 | 3129 | 57 51 32 | 3437 | 56 29 57 | 3446 |
| | Sun | E. | 118 16 20 | 3442 | 116 54 51 | 3438 | 115 33 18 | 3433 | 114 11 39 | 3428 |
| 14 | Spica | W. | 104 44 56 | 3017 | 106 14 48 | 3009 | 107 44 50 | 3001 | 109 15 1 | 2993 |
| | Jupiter | W. | 69 42 29 | 2993 | 71 12 50 | 2985 | 72 43 21 | 2977 | 74 14 2 | 2970 |
| | Antares | W. | 58 50 39 | 3017 | 60 20 31 | 3010 | 61 50 32 | 3002 | 63 20 43 | 2993 |
| | Saturn | E. | 30 8 52 | 3036 | 28 39 24 | 3028 | 27 9 46 | 3021 | 25 39 59 | 3013 |
| | α Pegasi | E. | 49 44 50 | 3505 | 48 24 31 | 3520 | 47 4 29 | 3538 | 45 44 47 | 3557 |
| | Sun | E. | 107 21 42 | 3394 | 105 59 19 | 3386 | 104 36 46 | 3377 | 103 14 3 | 3368 |
| 15 | Spica | W. | 116 48 41 | 2946 | 118 20 2 | 2935 | 119 51 37 | 2924 | 121 23 26 | 2913 |
| | Jupiter | W. | 81 50 15 | 2920 | 83 22 8 | 2910 | 84 54 14 | 2898 | 86 26 35 | 2887 |
| | Antares | W. | 70 54 23 | 2946 | 72 25 44 | 2935 | 73 57 19 | 2924 | 75 29 8 | 2913 |
| | α Aquilæ | W. | 37 15 0 | 6687 | 37 53 36 | 6402 | 38 34 49 | 6145 | 39 18 33 | 5911 |
| | Sun | E. | 96 17 45 | 3316 | 94 53 52 | 3305 | 93 29 46 | 3293 | 92 5 26 | 3280 |
| 16 | Jupiter | W. | 94 12 11 | 2824 | 95 46 8 | 2809 | 97 20 24 | 2795 | 98 54 58 | 2781 |
| | Antares | W. | 83 12 6 | 2848 | 84 45 32 | 2833 | 86 19 17 | 2819 | 87 53 20 | 2805 |
| | α Aquilæ | W. | 43 31 12 | 5025 | 44 27 48 | 4889 | 45 26 12 | 4763 | 46 26 19 | 4645 |
| | Sun | E. | 84 59 52 | 3210 | 83 33 55 | 3196 | 82 7 41 | 3180 | 80 41 8 | 3163 |
| 17 | Jupiter | W. | 106 52 41 | 2705 | 108 29 15 | 2688 | 110 6 11 | 2672 | 111 43 29 | 2655 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Antares | W. | 89° 27′ 42″ | 2789 | 91° 2′ 24″ | 2773 | 92° 37′ 27″ | 2758 | 94° 12′ 50″ | 2741 |
| | α Aquilæ | W. | 47 28 5 | 4538 | 48 31 24 | 4437 | 49 36 12 | 4343 | 50 42 25 | 4254 |
| | Sun | E. | 79 14 15 | 3148 | 77 47 3 | 3131 | 76 19 31 | 3114 | 74 51 38 | 3097 |
| 18 | Antares | W. | 102 15 14 | 2658 | 103 52 51 | 2640 | 105 30 52 | 2622 | 107 9 17 | 2604 |
| | α Aquilæ | W. | 56 32 44 | 3887 | 57 46 17 | 3826 | 59 0 52 | 3768 | 60 16 28 | 3713 |
| | Sun | E. | 67 26 56 | 3007 | 65 56 52 | 2989 | 64 26 26 | 2970 | 62 55 36 | 2952 |
| 19 | α Aquilæ | W. | 66 48 15 | 3474 | 68 9 8 | 3432 | 69 30 48 | 3393 | 70 53 12 | 3356 |
| | Fomalhaut | W. | 37 35 8 | 3206 | 39 1 10 | 3138 | 40 28 33 | 3077 | 41 57 11 | 3020 |
| | α Pegasi | W. | 22 5 35 | 5863 | 22 52 15 | 5370 | 23 44 31 | 4969 | 24 41 51 | 4635 |
| | Sun | E. | 55 15 27 | 2856 | 53 42 12 | 2837 | 52 8 32 | 2818 | 50 34 28 | 2800 |
| 20 | α Aquilæ | W. | 77 55 20 | 3195 | 79 21 35 | 3168 | 80 48 23 | 3142 | 82 15 42 | 3118 |
| | Fomalhaut | W. | 49 36 34 | 2788 | 51 11 17 | 2751 | 52 46 49 | 2715 | 54 23 9 | 2681 |
| | Sun | E. | 42 38 5 | 2709 | 41 1 37 | 2692 | 39 24 47 | 2675 | 37 47 34 | 2660 |
| 25 | Sun | W. | 26 44 28 | 2385 | 28 28 24 | 2384 | 30 12 22 | 2384 | 31 56 20 | 2385 |
| | Regulus | E. | 57 20 45 | 2035 | 55 28 5 | 2040 | 53 35 33 | 2046 | 51 43 10 | 2052 |
| | Spica | E. | 111 21 14 | 2032 | 109 28 29 | 2036 | 107 35 51 | 2042 | 105 43 22 | 2048 |
| 26 | Sun | W. | 40 34 56 | 2412 | 42 18 13 | 2421 | 44 1 18 | 2430 | 45 44 10 | 2439 |
| | Regulus | E. | 42 24 5 | 2094 | 40 32 57 | 2104 | 38 42 4 | 2115 | 36 51 27 | 2126 |
| | Spica | E. | 96 23 42 | 2088 | 94 32 25 | 2098 | 92 41 23 | 2108 | 90 50 36 | 2118 |
| 27 | Sun | W. | 54 14 49 | 2497 | 55 56 6 | 2510 | 57 37 6 | 2523 | 59 17 47 | 2537 |
| | Spica | E. | 81 40 56 | 2178 | 79 51 55 | 2191 | 78 3 14 | 2204 | 76 14 52 | 2217 |
| | Jupiter | E. | 115 7 34 | 2165 | 113 18 13 | 2177 | 111 29 10 | 2189 | 109 40 26 | 2202 |
| 28 | Sun | W. | 67 36 18 | 2610 | 69 14 59 | 2626 | 70 53 19 | 2641 | 72 31 19 | 2657 |
| | Venus | W. | 24 41 4 | 2519 | 26 21 51 | 2532 | 28 2 20 | 2546 | 29 42 30 | 2560 |
| | Spica | E. | 67 18 9 | 2287 | 65 31 51 | 2302 | 63 45 55 | 2317 | 62 0 20 | 2332 |
| | Jupiter | E. | 100 41 42 | 2270 | 98 54 59 | 2285 | 97 8 37 | 2299 | 95 22 36 | 2313 |
| | Antares | E. | 113 12 30 | 2287 | 111 26 12 | 2302 | 109 40 16 | 2318 | 107 54 42 | 2332 |
| 29 | Sun | W. | 80 35 58 | 2736 | 82 11 50 | 2752 | 83 47 21 | 2768 | 85 22 31 | 2784 |
| | Venus | W. | 37 58 23 | 2632 | 39 36 34 | 2647 | 41 14 25 | 2662 | 42 51 56 | 2677 |
| | Pollux | W. | 37 36 29 | 2414 | 39 19 44 | 2429 | 41 2 38 | 2443 | 42 45 12 | 2458 |
| | Spica | E. | 53 17 50 | 2406 | 51 34 24 | 2421 | 49 51 20 | 2436 | 48 8 37 | 2452 |
| | Jupiter | E. | 86 37 53 | 2388 | 84 54 1 | 2403 | 83 10 30 | 2417 | 81 27 20 | 2433 |
| | Antares | E. | 99 12 13 | 2407 | 97 28 48 | 2422 | 95 45 44 | 2436 | 94 3 1 | 2451 |
| 30 | Sun | W. | 93 13 10 | 2862 | 94 46 17 | 2878 | 96 19 4 | 2893 | 97 51 32 | 2909 |
| | Pollux | W. | 51 12 55 | 2529 | 52 53 28 | 2543 | 54 33 41 | 2556 | 56 13 36 | 2571 |
| | Venus | W. | 50 54 38 | 2749 | 52 30 13 | 2763 | 54 5 30 | 2776 | 55 40 29 | 2791 |
| | Spica | E. | 39 40 16 | 2525 | 37 59 37 | 2538 | 36 19 17 | 2553 | 34 39 17 | 2567 |
| | Jupiter | E. | 72 56 48 | 2507 | 71 15 44 | 2521 | 69 35 0 | 2536 | 67 54 37 | 2550 |
| | Antares | E. | 85 34 38 | 2525 | 83 53 59 | 2538 | 82 13 39 | 2553 | 80 33 39 | 2567 |
| 31 | Sun | W. | 105 29 3 | 2982 | 106 59 38 | 2997 | 108 29 55 | 3010 | 109 59 55 | 3025 |
| | Pollux | W. | 64 28 27 | 2638 | 66 6 31 | 2650 | 67 44 18 | 2663 | 69 21 48 | 2675 |
| | Venus | W. | 63 30 55 | 2857 | 65 4 9 | 2870 | 66 37 7 | 2883 | 68 9 48 | 2895 |
| | Regulus | W. | 27 41 23 | 2645 | 29 19 17 | 2656 | 30 56 56 | 2668 | 32 34 19 | 2680 |
| | Jupiter | E. | 59 37 34 | 2621 | 57 59 7 | 2634 | 56 20 58 | 2648 | 54 43 8 | 2662 |
| | Antares | E. | 72 18 22 | 2634 | 70 40 13 | 2647 | 69 2 22 | 2660 | 67 24 48 | 2672 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Antares | W. | 95° 48′ 35″ | 2725 | 97° 24′ 41″ | 2709 | 99° 1′ 9″ | 2692 | 100° 38′ 0″ | 2675 |
| | α Aquilæ | W. | 51 50 0 | 4173 | 52 58 52 | 4095 | 54 8 59 | 4022 | 55 20 17 | 3952 |
| | Sun | E. | 73 23 25 | 3080 | 71 54 51 | 3062 | 70 25 55 | 3044 | 68 56 37 | 3026 |
| 18 | Antares | W. | 108 48 6 | 2586 | 110 27 20 | 2568 | 112 6 59 | 2550 | 113 47 3 | 2531 |
| | α Aquilæ | W. | 61 33 1 | 3660 | 62 50 31 | 3610 | 64 8 54 | 3562 | 65 28 10 | 3517 |
| | Sun | E. | 61 24 23 | 2933 | 59 52 46 | 2913 | 58 20 44 | 2894 | 56 48 18 | 2875 |
| 19 | α Aquilæ | W. | 72 16 19 | 3320 | 73 40 7 | 3287 | 75 4 34 | 3254 | 76 29 39 | 3224 |
| | Fomalhaut | W. | 43 26 59 | 2967 | 44 57 53 | 2918 | 46 29 49 | 2872 | 48 2 44 | 2829 |
| | α Pegasi | W. | 25 43 46 | 4353 | 26 49 50 | 4115 | 27 59 37 | 3913 | 29 12 44 | 3737 |
| | Sun | E. | 49 0 0 | 2781 | 47 25 7 | 2763 | 45 49 50 | 2744 | 44 14 9 | 2727 |
| 20 | α Aquilæ | W. | 83 43 30 | 3095 | 85 11 46 | 3073 | 86 40 28 | 3054 | 88 9 34 | 3036 |
| | Fomalhaut | W. | 56 0 15 | 2649 | 57 38 4 | 2619 | 59 16 33 | 2590 | 60 55 42 | 2562 |
| | Sun | E. | 36 10 0 | 2645 | 34 32 6 | 2630 | 32 53 52 | 2617 | 31 15 20 | 2604 |
| 25 | Sun | W. | 33 40 16 | 2389 | 35 24 7 | 2393 | 37 7 52 | 2398 | 38 51 29 | 2405 |
| | Regulus | E. | 49 50 57 | 2059 | 47 58 55 | 2067 | 46 7 5 | 2075 | 44 15 28 | 2085 |
| | Spica | E. | 103 51 3 | 2055 | 101 58 55 | 2063 | 100 6 58 | 2070 | 98 15 13 | 2079 |
| 26 | Sun | W. | 47 26 49 | 2450 | 49 9 13 | 2461 | 50 51 21 | 2472 | 52 33 13 | 2484 |
| | Regulus | E. | 35 1 7 | 2137 | 33 11 5 | 2149 | 31 21 21 | 2163 | 29 31 57 | 2176 |
| | Spica | E. | 89 0 5 | 2130 | 87 9 51 | 2141 | 85 19 54 | 2153 | 83 30 16 | 2165 |
| 27 | Sun | W. | 60 58 9 | 2551 | 62 38 11 | 2565 | 64 17 54 | 2580 | 65 57 16 | 2595 |
| | Spica | E. | 74 26 50 | 2231 | 72 39 9 | 2245 | 70 51 48 | 2259 | 69 4 48 | 2273 |
| | Jupiter | E. | 107 52 1 | 2215 | 106 3 56 | 2229 | 104 16 11 | 2242 | 102 28 46 | 2256 |
| 28 | Sun | W. | 74 8 57 | 2672 | 75 46 14 | 2688 | 77 23 10 | 2704 | 78 59 45 | 2720 |
| | Venus | W. | 31 22 20 | 2574 | 33 1 50 | 2588 | 34 41 1 | 2603 | 36 19 52 | 2618 |
| | Spica | E. | 60 15 7 | 2346 | 58 30 15 | 2362 | 56 45 45 | 2377 | 55 1 37 | 2391 |
| | Jupiter | E. | 93 36 56 | 2328 | 91 51 38 | 2344 | 90 6 42 | 2358 | 88 22 7 | 2373 |
| | Antares | E. | 106 9 29 | 2347 | 104 24 38 | 2362 | 102 40 8 | 2377 | 100 56 0 | 2391 |
| 29 | Sun | W. | 86 57 20 | 2800 | 88 31 48 | 2815 | 90 5 56 | 2831 | 91 39 43 | 2847 |
| | Venus | W. | 44 29 7 | 2691 | 46 5 59 | 2706 | 47 42 31 | 2720 | 49 18 44 | 2735 |
| | Pollux | W. | 44 27 25 | 2472 | 46 9 18 | 2487 | 47 50 50 | 2501 | 49 32 2 | 2515 |
| | Spica | E. | 46 26 16 | 2466 | 44 44 15 | 2481 | 43 2 35 | 2495 | 41 21 15 | 2510 |
| | Jupiter | E. | 79 44 32 | 2448 | 78 2 5 | 2463 | 76 19 59 | 2477 | 74 38 13 | 2492 |
| | Antares | E. | 92 20 39 | 2466 | 90 38 38 | 2481 | 88 56 58 | 2495 | 87 15 38 | 2510 |
| 30 | Sun | W. | 99 23 40 | 2924 | 100 55 29 | 2939 | 102 26 59 | 2954 | 103 58 10 | 2968 |
| | Pollux | W. | 57 53 11 | 2585 | 59 32 27 | 2598 | 61 11 25 | 2611 | 62 50 5 | 2624 |
| | Venus | W. | 57 15 9 | 2805 | 58 49 31 | 2818 | 60 23 36 | 2831 | 61 57 24 | 2844 |
| | Spica | E. | 32 59 36 | 2580 | 31 20 14 | 2594 | 29 41 11 | 2607 | 28 2 26 | 2621 |
| | Jupiter | E. | 66 14 33 | 2564 | 64 34 49 | 2579 | 62 55 25 | 2593 | 61 16 20 | 2607 |
| | Antares | E. | 78 53 58 | 2580 | 77 14 36 | 2594 | 75 35 33 | 2607 | 73 56 48 | 2621 |
| 31 | Sun | W. | 111 29 37 | 3039 | 112 59 2 | 3052 | 114 28 11 | 3065 | 115 57 4 | 3078 |
| | Pollux | W. | 70 59 1 | 2687 | 72 35 58 | 2700 | 74 12 38 | 2711 | 75 49 3 | 2723 |
| | Venus | W. | 69 42 14 | 2906 | 71 14 25 | 2919 | 72 46 20 | 2930 | 74 18 1 | 2942 |
| | Regulus | W. | 34 11 26 | 2692 | 35 48 17 | 2703 | 37 24 53 | 2715 | 39 1 13 | 2725 |
| | Jupiter | E. | 53 5 37 | 2675 | 51 28 24 | 2689 | 49 51 29 | 2702 | 48 14 52 | 2715 |
| | Antares | E. | 65 47 30 | 2684 | 64 10 29 | 2696 | 62 33 44 | 2708 | 60 57 15 | 2720 |

# JUNE, 1876.

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be subtracted from* / *added to* *Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | Semi-diameter. | | | |
| | | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Thur. | 1 | 4 38 51.41 | 10.239 | N.22 8 50.4 | +19.81 | 15 48.23 | 68.45 | 2 22.74 | 0.381 |
| Frid. | 2 | 4 42 57.32 | 10.254 | 22 16 34.4 | 18.84 | 15 48.10 | 68.50 | 2 13.40 | 0.396 |
| Sat. | 3 | 4 47 3.60 | 10.269 | 22 23 55.1 | 17.87 | 15 47.98 | 68.55 | 2 3.71 | 0.410 |
| *Sun.* | 4 | 4 51 10.22 | 10.283 | 22 30 52.2 | 16.89 | 15 47.86 | 68.60 | 1 53.69 | 0.424 |
| Mon. | 5 | 4 55 17.16 | 10.296 | 22 37 25.8 | 15.90 | 15 47.75 | 68.65 | 1 43.33 | 0.437 |
| Tues. | 6 | 4 59 24.41 | 10.308 | 22 43 35.8 | 14.91 | 15 47.63 | 68.69 | 1 32.66 | 0.450 |
| Wed. | 7 | 5 3 31.96 | 10.320 | 22 49 21.7 | 13.91 | 15 47.52 | 68.73 | 1 21.70 | 0.462 |
| Thur. | 8 | 5 7 39.79 | 10.331 | 22 54 43.6 | 12.91 | 15 47.41 | 68.76 | 1 10.45 | 0.474 |
| Frid. | 9 | 5 11 47.90 | 10.342 | 22 59 41.6 | 11.91 | 15 47.31 | 68.80 | 0 58.93 | 0.485 |
| Sat. | 10 | 5 15 56.25 | 10.351 | 23 4 15.4 | 10.90 | 15 47.21 | 68.83 | 0 47.17 | 0.495 |
| *Sun.* | 11 | 5 20 4.84 | 10.361 | 23 8 25.0 | 9.89 | 15 47.11 | 68.86 | 0 35.17 | 0.504 |
| Mon. | 12 | 5 24 13.65 | 10.369 | 23 12 10.2 | 8.87 | 15 47.01 | 68.89 | 0 22.96 | 0.512 |
| Tues. | 13 | 5 28 22.64 | 10.377 | 23 15 30.8 | 7.85 | 15 46.92 | 68.91 | 0 10.57 | 0.520 |
| Wed. | 14 | 5 32 31.79 | 10.383 | 23 18 26.8 | 6.82 | 15 46.83 | 68.93 | 0 1.99 | 0.527 |
| Thur. | 15 | 5 36 41.11 | 10.389 | 23 20 58.1 | 5.79 | 15 46.75 | 68.94 | 0 14.71 | 0.533 |
| Frid. | 16 | 5 40 50.56 | 10.393 | 23 23 4.8 | 4.76 | 15 46.67 | 68.96 | 0 27.57 | 0.537 |
| Sat. | 17 | 5 45 0.09 | 10.397 | 23 24 46.7 | 3.73 | 15 46.60 | 68.97 | 0 40.51 | 0.541 |
| *Sun.* | 18 | 5 49 9.70 | 10.400 | 23 26 3.9 | 2.70 | 15 46.53 | 68.97 | 0 53.53 | 0.543 |
| Mon. | 19 | 5 53 19.35 | 10.402 | 23 26 56.3 | 1.67 | 15 46.47 | 68.97 | 1 6.59 | 0.545 |
| Tues. | 20 | 5 57 29.04 | 10.402 | 23 27 23.9 | + 0.63 | 15 46.41 | 68.97 | 1 19.68 | 0.545 |
| Wed. | 21 | 6 1 38.72 | 10.401 | 23 27 26.6 | − 0.41 | 15 46.35 | 68.97 | 1 32.77 | 0.545 |
| Thur. | 22 | 6 5 48.36 | 10.399 | 23 27 4.3 | 1.45 | 15 46.31 | 68.96 | 1 45.82 | 0.542 |
| Frid. | 23 | 6 9 57.94 | 10.396 | 23 26 17.1 | 2.48 | 15 46.27 | 68.95 | 1 58.80 | 0.539 |
| Sat. | 24 | 6 14 7.43 | 10.392 | 23 25 5.2 | 3.51 | 15 46.23 | 68.94 | 2 11.69 | 0.534 |
| *Sun.* | 25 | 6 18 16.80 | 10.387 | 23 23 28.6 | 4.54 | 15 46.20 | 68.93 | 2 24.47 | 0.526 |
| Mon. | 26 | 6 22 26.02 | 10.380 | 23 21 27.3 | 5.56 | 15 46.18 | 68.91 | 2 37.11 | 0.522 |
| Tues. | 27 | 6 26 35.08 | 10.373 | 23 19 1.3 | 6.59 | 15 46.16 | 68.88 | 2 49.57 | 0.515 |
| Wed. | 28 | 6 30 43.95 | 10.364 | 23 16 10.7 | 7.61 | 15 46.14 | 68.86 | 3 1.83 | 0.509 |
| Thur. | 29 | 6 34 52.59 | 10.354 | 23 12 55.7 | 8.63 | 15 46.13 | 68.83 | 3 13.88 | 0.497 |
| Frid. | 30 | 6 39 0.97 | 10.343 | 23 9 16.3 | 9.64 | 15 46.12 | 68.80 | 3 25.68 | 0.486 |
| Sat. | 31 | 6 43 9.09 | 10.331 | N.23 5 12.6 | −10.65 | 15 46.12 | 68.76 | 3 37.21 | 0.475 |

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting $0^{s}.19$ from the Sidereal Time.

+ prefixed to the hourly change of declination, indicates that north declinations are increasing.

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S *Apparent* Right Ascension. | THE SUN'S Diff. for 1 hour. | THE SUN'S *Apparent* Declination. | THE SUN'S Diff. for 1 hour. | Equation of Time, *to be added to* / *subtracted from* *Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Thur. | 1 | 4 38 51.82 | 10.238 | N.22 8 51.2 | +19.81 | 2 22.72 | 0.381 | 4 41 14.54 |
| Frid. | 2 | 4 42 57.71 | 10.253 | 22 16 35.1 | 18.84 | 2 13.38 | 0.396 | 4 45 11.09 |
| Sat. | 3 | 4 47 3.96 | 10.268 | 22 23 55.7 | 17.87 | 2 3.69 | 0.410 | 4 49 7.65 |
| *Sun.* | 4 | 4 51 10.55 | 10.282 | 22 30 52.8 | 16.89 | 1 53.66 | 0.424 | 4 53 4.21 |
| Mon. | 5 | 4 55 17.46 | 10.295 | 22 37 26.3 | 15.90 | 1 43.31 | 0.437 | 4 57 0.77 |
| Tues. | 6 | 4 59 24.68 | 10.307 | 22 43 36.1 | 14.91 | 1 32.65 | 0.450 | 5 0 57.33 |
| Wed. | 7 | 5 3 32.20 | 10.319 | 22 49 22.0 | 13.91 | 1 21.69 | 0.462 | 5 4 53.89 |
| Thur. | 8 | 5 7 40.00 | 10.330 | 22 54 43.9 | 12.91 | 1 10.44 | 0.474 | 5 8 50.44 |
| Frid. | 9 | 5 11 48.08 | 10.341 | 22 59 41.8 | 11.91 | 0 58.92 | 0.485 | 5 12 47.00 |
| Sat. | 10 | 5 15 56.40 | 10.351 | 23 4 15.6 | 10.90 | 0 47.16 | 0.495 | 5 16 43.56 |
| *Sun.* | 11 | 5 20 4.95 | 10.360 | 23 8 25.1 | 9.89 | 0 35.17 | 0.504 | 5 20 40.12 |
| Mon. | 12 | 5 24 13.72 | 10.368 | 23 12 10.2 | 8.87 | 0 22.96 | 0.512 | 5 24 36.68 |
| Tues. | 13 | 5 28 22.67 | 10.376 | 23 15 30.8 | 7.85 | 0 10.57 | 0.520 | 5 28 33.24 |
| Wed. | 14 | 5 32 31.79 | 10.382 | 23 18 26.8 | 6.82 | 0 1.99 | 0.527 | 5 32 29.80 |
| Thur. | 15 | 5 36 41.07 | 10.388 | 23 20 58.1 | 5.79 | 0 14.71 | 0.533 | 5 36 26.36 |
| Frid. | 16 | 5 40 50.48 | 10.392 | 23 23 4.8 | 4.76 | 0 27.57 | 0.537 | 5 40 22.91 |
| Sat. | 17 | 5 44 59.98 | 10.396 | 23 24 46.7 | 3.73 | 0 40.51 | 0.541 | 5 44 19.47 |
| *Sun.* | 18 | 5 49 9.55 | 10.399 | 23 26 3.9 | 2.70 | 0 53.52 | 0.543 | 5 48 16.03 |
| Mon. | 19 | 5 53 19.17 | 10.401 | 23 26 56.3 | 1.67 | 1 6.58 | 0.545 | 5 52 12.59 |
| Tues. | 20 | 5 57 28.82 | 10.401 | 23 27 23.9 | + 0.63 | 1 19.67 | 0.545 | 5 56 9.15 |
| Wed. | 21 | 6 1 38.46 | 10.400 | 23 27 26.6 | − 0.41 | 1 32.75 | 0.545 | 6 0 5.71 |
| Thur. | 22 | 6 5 48.07 | 10.398 | 23 27 4.3 | 1.45 | 1 45.80 | 0.542 | 6 4 2.27 |
| Frid. | 23 | 6 9 57.61 | 10.395 | 23 26 17.1 | 2.48 | 1 58.78 | 0.539 | 6 7 58.83 |
| Sat. | 24 | 6 14 7.06 | 10.391 | 23 25 5.2 | 3.51 | 2 11.68 | 0.534 | 6 11 55.38 |
| *Sun.* | 25 | 6 18 16.39 | 10.386 | 23 23 28.7 | 4.54 | 2 24.45 | 0.529 | 6 15 51.94 |
| Mon. | 26 | 6 22 25.58 | 10.379 | 23 21 27.5 | 5.56 | 2 37.08 | 0.522 | 6 19 48.50 |
| Tues. | 27 | 6 26 34.60 | 10.372 | 23 19 1.5 | 6.59 | 2 49.54 | 0.515 | 6 23 45.06 |
| Wed. | 28 | 6 30 43.43 | 10.363 | 23 16 11.1 | 7.61 | 3 1.81 | 0.506 | 6 27 41.62 |
| Thur. | 29 | 6 34 52.04 | 10.353 | 23 12 56.1 | 8.63 | 3 13.86 | 0.497 | 6 31 38.18 |
| Frid. | 30 | 6 39 0.39 | 10.342 | 23 9 16.8 | 9.64 | 3 25.65 | 0.486 | 6 35 34.74 |
| Sat. | 31 | 6 43 8.48 | 10.331 | N.23 5 13.2 | −10.66 | 3 37.18 | 0.475 | 6 39 31.30 |

**Note.**—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing.

Diff. for 1 hour. $+9^{s}.8565$

## AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | *True* LONGITUDE. | | Diff. for 1 hour. | LATITUDE. | | | |
| | | λ | λ′ | | | | | |
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 153 | 71 16 35.0 | 16 13.5 | 143.62 | +0.11 | 0.0062594 | +24.3 | 19 15 35.63 |
| 2 | 154 | 72 14 0.9 | 13 39.2 | 143.56 | −0.02 | .0063170 | 23.7 | 19 11 39.72 |
| 3 | 155 | 73 11 25.6 | 11 3.7 | 143.51 | 0.14 | .0063733 | 23.1 | 19 7 43.81 |
| 4 | 156 | 74 8 49.2 | 8 27.1 | 143.46 | 0.24 | .0064282 | 22.5 | 19 3 47.89 |
| 5 | 157 | 75 6 11.8 | 5 49.5 | 143.42 | 0.33 | .0064817 | 21.9 | 18 59 51.98 |
| 6 | 158 | 76 3 33.5 | 3 11.0 | 143.38 | 0.39 | .0065337 | 21.4 | 18 55 56.07 |
| 7 | 159 | 77 0 54.3 | 0 31.6 | 143.35 | 0.41 | .0065845 | 20.9 | 18 52 0.16 |
| 8 | 160 | 77 58 14.4 | 57 51.5 | 143.32 | 0.41 | .0066341 | 20.4 | 18 48 4.24 |
| 9 | 161 | 78 55 33.9 | 55 10.8 | 143.30 | 0.38 | .0066823 | 19.8 | 18 44 8.33 |
| 10 | 162 | 79 52 52.8 | 52 29.5 | 143.27 | 0.30 | .0067292 | 19.3 | 18 40 12.42 |
| 11 | 163 | 80 50 11.1 | 49 47.6 | 143.25 | 0.21 | .0067747 | 18.7 | 18 36 16.51 |
| 12 | 164 | 81 47 28.9 | 47 5.2 | 143.23 | −0.11 | .0068186 | 18.0 | 18 32 20.59 |
| 13 | 165 | 82 44 46.3 | 44 22.4 | 143.22 | +0.01 | .0068608 | 17.2 | 18 28 24.68 |
| 14 | 166 | 83 42 3.4 | 41 39.3 | 143.20 | 0.14 | .0069010 | 16.4 | 18 24 28.77 |
| 15 | 167 | 84 39 20.1 | 38 55.8 | 143.19 | 0.26 | .0069394 | 15.6 | 18 20 32.85 |
| 16 | 168 | 85 36 36.6 | 36 12.1 | 143.18 | 0.40 | .0069757 | 14.7 | 18 16 36.94 |
| 17 | 169 | 86 33 52.8 | 33 28.1 | 143.17 | 0.51 | .0070098 | 13.7 | 18 12 41.02 |
| 18 | 170 | 87 31 6.7 | 30 43.8 | 143.16 | 0.61 | .0070415 | 12.7 | 18 8 45.11 |
| 19 | 171 | 88 28 24.4 | 27 59.3 | 143.15 | 0.68 | .0070707 | 11.6 | 18 4 49.20 |
| 20 | 172 | 89 25 39.9 | 25 14.6 | 143.14 | 0.70 | .0070974 | 10.6 | 18 0 53.28 |
| 21 | 173 | 90 22 55.0 | 22 29.5 | 143.12 | 0.71 | .0071215 | 9.5 | 17 56 57.37 |
| 22 | 174 | 91 20 9.8 | 19 44.1 | 143.11 | 0.67 | .0071430 | 8.4 | 17 53 1.46 |
| 23 | 175 | 92 17 24.2 | 16 58.3 | 143.09 | 0.63 | .0071618 | 7.3 | 17 49 5.55 |
| 24 | 176 | 93 14 38.3 | 14 12.2 | 143.08 | 0.54 | .0071780 | 6.2 | 17 45 9.63 |
| 25 | 177 | 94 11 52.0 | 11 25.7 | 143.06 | 0.45 | .0071916 | 5.1 | 17 41 13.72 |
| 26 | 178 | 95 9 5.2 | 8 38.7 | 143.05 | 0.33 | .0072027 | 4.1 | 17 37 17.81 |
| 27 | 179 | 96 6 18.0 | 5 51.3 | 143.03 | 0.20 | .0072114 | 3.2 | 17 33 21.89 |
| 28 | 180 | 97 3 30.4 | 3 3.5 | 143.01 | +0.06 | .0072178 | 2.3 | 17 29 25.98 |
| 29 | 181 | 98 0 42.3 | 0 15.3 | 142.99 | −0.07 | .0072221 | 1.4 | 17 25 30.07 |
| 30 | 182 | 98 57 53.8 | 57 26.6 | 142.97 | 0.20 | .0072245 | + 0.6 | 17 21 34.16 |
| 31 | 183 | 99 55 5.0 | 54 37.6 | 142.96 | −0.30 | 0.0072250 | − 0.2 | 17 17 38.25 |

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
—9$^{s}$.8296

## GREENWICH MEAN TIME.

### THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | MERIDIAN PASSAGE. | | AGE. |
|---|---|---|---|---|---|---|---|---|---|
| | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. | | Diff. for 1 hour. | Noon. |
| | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 15 23.2 | 15 18.1 | 56 21.5 | −1.60 | 56 2.9 | −1.49 | 8 2.8 | 1.77 | 8.9 |
| 2 | 15 13.4 | 15 9.2 | 55 45.7 | 1.38 | 55 29.9 | 1.26 | 8 45.7 | 1.80 | 9.9 |
| 3 | 15 5.2 | 15 1.6 | 55 15.4 | 1.15 | 55 2.2 | 1.05 | 9 29.8 | 1.87 | 10.9 |
| 4 | 14 58.4 | 14 55.4 | 54 50.2 | 0.95 | 54 39.5 | 0.84 | 10 15.9 | 1.97 | 11.9 |
| 5 | 14 52.9 | 14 50.6 | 54 30.1 | 0.74 | 54 21.8 | 0.64 | 11 4.4 | 2.07 | 12.9 |
| 6 | 14 48.7 | 14 47.2 | 54 14.8 | 0.53 | 54 9.0 | 0.43 | 11 54.9 | 2.14 | 13.9 |
| 7 | 14 45.9 | 14 45.0 | 54 4.5 | 0.33 | 54 1.2 | −0.22 | 12 46.5 | 2.16 | 14.9 |
| 8 | 14 44.5 | 14 44.4 | 53 59.3 | −0.10 | 53 58.8 | +0.02 | 13 38.0 | 2.12 | 15.9 |
| 9 | 14 44.6 | 14 45.3 | 53 59.8 | +0.15 | 54 2.4 | 0.29 | 14 28.1 | 2.04 | 16.9 |
| 10 | 14 46.5 | 14 48.2 | 54 6.8 | 0.44 | 54 13.0 | 0.59 | 15 15.9 | 1.94 | 17.9 |
| 11 | 14 50.4 | 14 53.2 | 54 21.1 | 0.76 | 54 31.2 | 0.93 | 16 1.4 | 1.85 | 18.9 |
| 12 | 14 56.5 | 15 0.4 | 54 43.4 | 1.10 | 54 57.7 | 1.28 | 16 44.9 | 1.78 | 19.9 |
| 13 | 15 4.9 | 15 9.9 | 55 14.2 | 1.46 | 55 32.8 | 1.64 | 17 27.1 | 1.74 | 20.9 |
| 14 | 15 15.5 | 15 21.7 | 55 53.5 | 1.81 | 56 16.1 | 1.96 | 18 9.1 | 1.77 | 21.9 |
| 15 | 15 28.4 | 15 35.4 | 56 40.5 | 2.10 | 57 6.5 | 2.23 | 18 52.3 | 1.85 | 22.9 |
| 16 | 15 42.9 | 15 50.5 | 57 33.8 | 2.32 | 58 2.0 | 2.37 | 19 38.2 | 1.99 | 23.9 |
| 17 | 15 58.3 | 16 6.1 | 58 30.6 | 2.38 | 58 59.0 | 2.35 | 20 28.2 | 2.20 | 24.9 |
| 18 | 16 13.6 | 16 20.8 | 59 26.7 | 2.26 | 59 53.0 | 2.11 | 21 23.9 | 2.45 | 25.9 |
| 19 | 16 27.4 | 16 33.1 | 60 17.1 | 1.89 | 60 38.2 | 1.62 | 22 25.7 | 2.70 | 26.9 |
| 20 | 16 37.9 | 16 41.5 | 60 55.8 | 1.30 | 61 9.2 | 0.94 | 23 32.5 | 2.85 | 27.9 |
| 21 | 16 44.0 | 16 45.0 | 61 18.2 | +0.54 | 61 22.1 | +0.13 | 6 | | 28.9 |
| 22 | 16 44.8 | 16 43.2 | 61 21.2 | −0.29 | 61 15.2 | −0.70 | 0 40.9 | 2.82 | 0.6 |
| 23 | 16 40.3 | 16 36.3 | 61 4.6 | 1.07 | 60 49.7 | 1.41 | 1 46.8 | 2.64 | 1.6 |
| 24 | 16 31.1 | 16 25.1 | 60 31.0 | 1.71 | 60 9.0 | 1.94 | 2 47.3 | 2.39 | 2.6 |
| 25 | 16 18.5 | 16 11.4 | 59 44.6 | 2.11 | 59 18.5 | 2.23 | 3 41.9 | 2.16 | 3.6 |
| 26 | 16 4.0 | 15 56.4 | 58 51.2 | 2.30 | 58 23.4 | 2.32 | 4 31.4 | 1.97 | 4.6 |
| 27 | 15 48.8 | 15 41.5 | 57 55.7 | 2.29 | 57 28.7 | 2.22 | 5 17.3 | 1.86 | 5.6 |
| 28 | 15 34.4 | 15 27.7 | 57 2.6 | 2.12 | 56 37.9 | 2.00 | 6 1.1 | 1.81 | 6.6 |
| 29 | 15 21.3 | 15 15.5 | 56 14.7 | 1.86 | 55 53.3 | 1.71 | 6 44.3 | 1.81 | 7.6 |
| 30 | 15 10.1 | 15 5.3 | 55 33.6 | 1.56 | 55 15.9 | 1.40 | 7 28.2 | 1.86 | 8.6 |
| 31 | 15 1.0 | 14 57.2 | 55 0.0 | −1.24 | 54 46.1 | −1.08 | 8 13.7 | 1.94 | 9.6 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### THURSDAY 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 12 30 14.15 | 1.8882 | S. 4 27 57.0 | 15.122 |
| 1 | 12 32 7.43 | 1.8879 | 4 43 3.4 | 15.090 |
| 2 | 12 34 0.70 | 1.8877 | 4 58 7.8 | 15.058 |
| 3 | 12 35 53.96 | 1.8876 | 5 13 10.3 | 15.024 |
| 4 | 12 37 47.21 | 1.8874 | 5 28 10.7 | 14.988 |
| 5 | 12 39 40.45 | 1.8874 | 5 43 8.9 | 14.953 |
| 6 | 12 41 33.70 | 1.8876 | 5 58 5.0 | 14.917 |
| 7 | 12 43 26.96 | 1.8878 | 6 12 58.9 | 14.879 |
| 8 | 12 45 20.23 | 1.8880 | 6 27 50.5 | 14.841 |
| 9 | 12 47 13.52 | 1.8883 | 6 42 39.8 | 14.802 |
| 10 | 12 49 6.83 | 1.8887 | 6 57 26.7 | 14.762 |
| 11 | 12 51 0.16 | 1.8891 | 7 12 11.2 | 14.721 |
| 12 | 12 52 53.52 | 1.8897 | 7 26 53.2 | 14.678 |
| 13 | 12 54 46.92 | 1.8903 | 7 41 32.6 | 14.636 |
| 14 | 12 56 40.36 | 1.8910 | 7 56 9.5 | 14.593 |
| 15 | 12 58 33.84 | 1.8918 | 8 10 43.8 | 14.549 |
| 16 | 13 0 27.37 | 1.8927 | 8 25 15.4 | 14.504 |
| 17 | 13 2 20.96 | 1.8936 | 8 39 44.3 | 14.457 |
| 18 | 13 4 14.60 | 1.8945 | 8 54 10.3 | 14.410 |
| 19 | 13 6 8.30 | 1.8956 | 9 8 33.5 | 14.362 |
| 20 | 13 8 2.07 | 1.8967 | 9 22 53.8 | 14.314 |
| 21 | 13 9 55.91 | 1.8079 | 9 37 11.2 | 14.265 |
| 22 | 13 11 49.82 | 1.8992 | 9 51 25.6 | 14.215 |
| 23 | 13 13 43.81 | 1.9005 | S. 10 5 37.0 | 14.163 |

### FRIDAY 2.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 13 15 37.88 | 1.9019 | S. 10 19 45.2 | 14.111 |
| 1 | 13 17 32.04 | 1.9034 | 10 33 50.3 | 14.058 |
| 2 | 13 19 26.29 | 1.9049 | 10 47 52.2 | 14.004 |
| 3 | 13 21 20.63 | 1.9065 | 11 1 50.8 | 13.949 |
| 4 | 13 23 15.07 | 1.9082 | 11 15 46.1 | 13.894 |
| 5 | 13 25 9.62 | 1.9100 | 11 29 38.1 | 13.837 |
| 6 | 13 27 4.27 | 1.9118 | 11 43 26.6 | 13.780 |
| 7 | 13 28 59.03 | 1.9137 | 11 57 11.7 | 13.722 |
| 8 | 13 30 53.91 | 1.9156 | 12 10 53.3 | 13.663 |
| 9 | 13 32 48.90 | 1.9175 | 12 24 31.3 | 13.603 |
| 10 | 13 34 44.01 | 1.9196 | 12 38 5.7 | 13.543 |
| 11 | 13 36 39.25 | 1.9217 | 12 51 36.5 | 13.481 |
| 12 | 13 38 34.61 | 1.9238 | 13 5 3.5 | 13.419 |
| 13 | 13 40 30.10 | 1.9260 | 13 18 26.8 | 13.357 |
| 14 | 13 42 25.73 | 1.9283 | 13 31 46.3 | 13.293 |
| 15 | 13 44 21.50 | 1.9307 | 13 45 1.9 | 13.227 |
| 16 | 13 46 17.42 | 1.9331 | 13 58 13.5 | 13.160 |
| 17 | 13 48 13.48 | 1.9355 | 14 11 21.1 | 13.093 |
| 18 | 13 50 9.68 | 1.9379 | 14 24 24.7 | 13.026 |
| 19 | 13 52 6.03 | 1.9405 | 14 37 24.3 | 12.958 |
| 20 | 13 54 2.54 | 1.9432 | 14 50 19.7 | 12.888 |
| 21 | 13 55 59.21 | 1.9458 | 15 3 10.9 | 12.818 |
| 22 | 13 57 56.04 | 1.9485 | 15 15 57.9 | 12.747 |
| 23 | 13 59 53.03 | 1.9513 | 15 28 40.6 | 12.676 |
| 24 | 14 1 50.19 | 1.9541 | S. 15 41 19.0 | 12.603 |

### SATURDAY 3.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 14 1 50.19 | 1.9541 | S. 15 41 19.0 | 12.603 |
| 1 | 14 3 47.52 | 1.9569 | 15 53 53.0 | 12.530 |
| 2 | 14 5 45.02 | 1.9598 | 16 6 22.6 | 12.455 |
| 3 | 14 7 42.70 | 1.9627 | 16 18 47.6 | 12.379 |
| 4 | 14 9 40.55 | 1.9657 | 16 31 8.1 | 12.303 |
| 5 | 14 11 38.58 | 1.9687 | 16 43 24.0 | 12.227 |
| 6 | 14 13 36.80 | 1.9718 | 16 55 35.3 | 12.149 |
| 7 | 14 15 35.20 | 1.9749 | 17 7 41.9 | 12.070 |
| 8 | 14 17 33.79 | 1.9781 | 17 19 43.7 | 11.990 |
| 9 | 14 19 32.57 | 1.9813 | 17 31 40.7 | 11.910 |
| 10 | 14 21 31.54 | 1.9845 | 17 43 32.9 | 11.828 |
| 11 | 14 23 30.71 | 1.9878 | 17 55 20.1 | 11.746 |
| 12 | 14 25 30.08 | 1.9912 | 18 7 2.4 | 11.663 |
| 13 | 14 27 29.65 | 1.9945 | 18 18 39.7 | 11.579 |
| 14 | 14 29 29.42 | 1.9979 | 18 30 11.9 | 11.494 |
| 15 | 14 31 29.39 | 2.0012 | 18 41 39.0 | 11.408 |
| 16 | 14 33 29.56 | 2.0046 | 18 53 0.9 | 11.322 |
| 17 | 14 35 29.94 | 2.0081 | 19 4 17.6 | 11.234 |
| 18 | 14 37 30.53 | 2.0116 | 19 15 29.0 | 11.146 |
| 19 | 14 39 31.33 | 2.0151 | 19 26 35.1 | 11.057 |
| 20 | 14 41 32.34 | 2.0186 | 19 37 35.8 | 10.967 |
| 21 | 14 43 33.56 | 2.0222 | 19 48 31.1 | 10.876 |
| 22 | 14 45 35.00 | 2.0257 | 19 59 20.9 | 10.784 |
| 23 | 14 47 36.65 | 2.0293 | S. 20 10 5.2 | 10.692 |

### SUNDAY 4.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 14 49 38.52 | 2.0330 | S. 20 20 43.9 | 10.598 |
| 1 | 14 51 40.61 | 2.0367 | 20 31 17.0 | 10.504 |
| 2 | 14 53 42.92 | 2.0403 | 20 41 44.4 | 10.408 |
| 3 | 14 55 45.44 | 2.0439 | 20 52 6.0 | 10.312 |
| 4 | 14 57 48.18 | 2.0476 | 21 2 21.9 | 10.216 |
| 5 | 14 59 51.15 | 2.0513 | 21 12 32.0 | 10.118 |
| 6 | 15 1 54.34 | 2.0550 | 21 22 36.1 | 10.019 |
| 7 | 15 3 57.75 | 2.0587 | 21 32 34.3 | 9.920 |
| 8 | 15 6 1.39 | 2.0625 | 21 42 26.5 | 9.820 |
| 9 | 15 8 5.25 | 2.0662 | 21 52 12.7 | 9.719 |
| 10 | 15 10 9.33 | 2.0699 | 22 1 52.8 | 9.617 |
| 11 | 15 12 13.64 | 2.0737 | 22 11 26.8 | 9.514 |
| 12 | 15 14 18.17 | 2.0774 | 22 20 54.5 | 9.410 |
| 13 | 15 16 22.93 | 2.0812 | 22 30 16.0 | 9.307 |
| 14 | 15 18 27.91 | 2.0848 | 22 39 31.3 | 9.202 |
| 15 | 15 20 33.11 | 2.0886 | 22 48 40.2 | 9.095 |
| 16 | 15 22 38.54 | 2.0923 | 22 57 42.7 | 8.988 |
| 17 | 15 24 44.19 | 2.0961 | 23 6 38.8 | 8.881 |
| 18 | 15 26 50.07 | 2.0998 | 23 15 28.4 | 8.772 |
| 19 | 15 28 56.17 | 2.1035 | 23 24 11.4 | 8.663 |
| 20 | 15 31 2.49 | 2.1072 | 23 32 47.9 | 8.553 |
| 21 | 15 33 9.03 | 2.1108 | 23 41 17.8 | 8.442 |
| 22 | 15 35 15.79 | 2.1145 | 23 49 41.0 | 8.330 |
| 23 | 15 37 22.77 | 2.1182 | 23 57 57.4 | 8.218 |
| 24 | 15 39 29.97 | 2.1218 | S. 24 6 7.1 | 8.105 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | **MONDAY 5.** | | | |
| | h m s | s | ° ′ ″ | ″ |
| 0 | 15 39 29.97 | 2.1218 | S.24 6 7.1 | 8.105 |
| 1 | 15 41 37.39 | 2.1254 | 24 14 10.0 | 7.991 |
| 2 | 15 43 45.02 | 2.1290 | 24 22 6.0 | 7.876 |
| 3 | 15 45 52.87 | 2.1326 | 24 29 55.1 | 7.760 |
| 4 | 15 48 0.93 | 2.1361 | 24 37 37.2 | 7.644 |
| 5 | 15 50 9.20 | 2.1397 | 24 45 12.4 | 7.528 |
| 6 | 15 52 17.69 | 2.1432 | 24 52 40.6 | 7.411 |
| 7 | 15 54 26.38 | 2.1466 | 25 0 1.7 | 7.292 |
| 8 | 15 56 35.28 | 2.1500 | 25 7 15.6 | 7.173 |
| 9 | 15 58 44.38 | 2.1533 | 25 14 22.4 | 7.053 |
| 10 | 16 0 53.68 | 2.1567 | 25 21 22.0 | 6.932 |
| 11 | 16 3 3.18 | 2.1601 | 25 28 14.3 | 6.812 |
| 12 | 16 5 12.89 | 2.1634 | 25 34 59.4 | 6.691 |
| 13 | 16 7 22.79 | 2.1666 | 25 41 37.2 | 6.568 |
| 14 | 16 9 32.88 | 2.1697 | 25 48 7.5 | 6.444 |
| 15 | 16 11 43.16 | 2.1729 | 25 54 30.4 | 6.320 |
| 16 | 16 13 53.63 | 2.1761 | 26 0 45.9 | 6.197 |
| 17 | 16 16 4.29 | 2.1792 | 26 6 54.0 | 6.072 |
| 18 | 16 18 15.13 | 2.1822 | 26 12 54.5 | 5.945 |
| 19 | 16 20 26.15 | 2.1851 | 26 18 47.4 | 5.819 |
| 20 | 16 22 37.34 | 2.1880 | 26 24 32.8 | 5.693 |
| 21 | 16 24 48.71 | 2.1909 | 26 30 10.6 | 5.566 |
| 22 | 16 27 0.25 | 2.1937 | 26 35 40.7 | 5.437 |
| 23 | 16 29 11.95 | 2.1964 | S.26 41 3.1 | 5.308 |
| | **TUESDAY 6.** | | | |
| 0 | 16 31 23.81 | 2.1991 | S.26 46 17.7 | 5.179 |
| 1 | 16 33 35.84 | 2.2017 | 26 51 24.6 | 5.050 |
| 2 | 16 35 48.02 | 2.2042 | 26 56 23.7 | 4.920 |
| 3 | 16 38 0.35 | 2.2067 | 27 1 15.0 | 4.790 |
| 4 | 16 40 12.83 | 2.2092 | 27 5 58.5 | 4.659 |
| 5 | 16 42 25.46 | 2.2117 | 27 10 34.1 | 4.527 |
| 6 | 16 44 38.23 | 2.2140 | 27 15 1.7 | 4.394 |
| 7 | 16 46 51.14 | 2.2162 | 27 19 21.4 | 4.261 |
| 8 | 16 49 4.18 | 2.2183 | 27 23 33.1 | 4.128 |
| 9 | 16 51 17.34 | 2.2203 | 27 27 36.8 | 3.995 |
| 10 | 16 53 30.62 | 2.2224 | 27 31 32.5 | 3.862 |
| 11 | 16 55 44.03 | 2.2245 | 27 35 20.2 | 3.728 |
| 12 | 16 57 57.56 | 2.2264 | 27 38 59.9 | 3.594 |
| 13 | 17 0 11.20 | 2.2282 | 27 42 31.5 | 3.459 |
| 14 | 17 2 24.94 | 2.2298 | 27 45 54.9 | 3.323 |
| 15 | 17 4 38.78 | 2.2315 | 27 49 10.2 | 3.188 |
| 16 | 17 6 52.72 | 2.2331 | 27 52 17.4 | 3.052 |
| 17 | 17 9 6.75 | 2.2346 | 27 55 16.4 | 2.915 |
| 18 | 17 11 20.87 | 2.2360 | 27 58 7.2 | 2.778 |
| 19 | 17 13 35.07 | 2.2373 | 28 0 49.8 | 2.642 |
| 20 | 17 15 49.35 | 2.2386 | 28 3 24.2 | 2.505 |
| 21 | 17 18 3.70 | 2.2398 | 28 5 50.4 | 2.368 |
| 22 | 17 20 18.12 | 2.2409 | 28 8 8.4 | 2.231 |
| 23 | 17 22 32.61 | 2.2420 | 28 10 18.1 | 2.093 |
| 24 | 17 24 47.16 | 2.2429 | S.28 12 19.5 | 1.954 |

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | **WEDNESDAY 7.** | | | |
| | h m s | s | ° ′ ″ | ″ |
| 0 | 17 24 47.16 | 2.2429 | S.28 12 19.5 | 1.954 |
| 1 | 17 27 1.76 | 2.2436 | 28 14 12.6 | 1.817 |
| 2 | 17 29 16.40 | 2.2443 | 28 15 57.5 | 1.679 |
| 3 | 17 31 31.08 | 2.2450 | 28 17 34.1 | 1.541 |
| 4 | 17 33 45.80 | 2.2457 | 28 19 2.4 | 1.402 |
| 5 | 17 36 0.56 | 2.2462 | 28 20 22.3 | 1.263 |
| 6 | 17 38 15.35 | 2.2467 | 28 21 33.9 | 1.124 |
| 7 | 17 40 30.16 | 2.2469 | 28 22 37.2 | 0.986 |
| 8 | 17 42 44.98 | 2.2471 | 28 23 32.2 | 0.847 |
| 9 | 17 44 59.81 | 2.2472 | 28 24 18.8 | 0.708 |
| 10 | 17 47 14.65 | 2.2473 | 28 24 57.1 | 0.569 |
| 11 | 17 49 29.49 | 2.2473 | 28 25 27.1 | 0.431 |
| 12 | 17 51 44.33 | 2.2472 | 28 25 48.8 | 0.292 |
| 13 | 17 53 59.16 | 2.2470 | 28 26 2.1 | 0.152 |
| 14 | 17 56 13.97 | 2.2467 | 28 26 7.1 | −0.013 |
| 15 | 17 58 28.76 | 2.2463 | 28 26 3.7 | +0.126 |
| 16 | 18 0 43.53 | 2.2458 | 28 25 52.0 | 0.264 |
| 17 | 18 2 58.26 | 2.2453 | 28 25 32.0 | 0.402 |
| 18 | 18 5 12.96 | 2.2447 | 28 25 3.8 | 0.539 |
| 19 | 18 7 27.62 | 2.2439 | 28 24 27.3 | 0.678 |
| 20 | 18 9 42.23 | 2.2431 | 28 23 42.4 | 0.817 |
| 21 | 18 11 56.79 | 2.2422 | 28 22 49.2 | 0.955 |
| 22 | 18 14 11.29 | 2.2412 | 28 21 47.8 | 1.093 |
| 23 | 18 16 25.73 | 2.2402 | S.28 20 38.1 | 1.231 |
| | **THURSDAY 8.** | | | |
| 0 | 18 18 40.11 | 2.2391 | S.28 19 20.1 | 1.368 |
| 1 | 18 20 54.42 | 2.2378 | 28 17 53.9 | 1.505 |
| 2 | 18 23 8.65 | 2.2364 | 28 16 19.5 | 1.642 |
| 3 | 18 25 22.79 | 2.2349 | 28 14 36.9 | 1.778 |
| 4 | 18 27 36.84 | 2.2334 | 28 12 46.1 | 1.915 |
| 5 | 18 29 50.80 | 2.2319 | 28 10 47.1 | 2.051 |
| 6 | 18 32 4.67 | 2.2303 | 28 8 40.0 | 2.187 |
| 7 | 18 34 18.44 | 2.2286 | 28 6 24.7 | 2.322 |
| 8 | 18 36 32.10 | 2.2267 | 28 4 1.3 | 2.457 |
| 9 | 18 38 45.65 | 2.2248 | 28 1 29.8 | 2.592 |
| 10 | 18 40 59.08 | 2.2229 | 27 58 50.2 | 2.727 |
| 11 | 18 43 12.40 | 2.2209 | 27 56 2.6 | 2.861 |
| 12 | 18 45 25.59 | 2.2188 | 27 53 6.9 | 2.995 |
| 13 | 18 47 38.65 | 2.2166 | 27 50 3.2 | 3.128 |
| 14 | 18 49 51.58 | 2.2144 | 27 46 51.6 | 3.260 |
| 15 | 18 52 4.38 | 2.2121 | 27 43 32.0 | 3.393 |
| 16 | 18 54 17.03 | 2.2096 | 27 40 4.5 | 3.525 |
| 17 | 18 56 29.53 | 2.2071 | 27 36 29.0 | 3.657 |
| 18 | 18 58 41.88 | 2.2046 | 27 32 45.6 | 3.788 |
| 19 | 19 0 54.08 | 2.2021 | 27 28 54.4 | 3.918 |
| 20 | 19 3 6.13 | 2.1995 | 27 24 55.4 | 4.047 |
| 21 | 19 5 18.02 | 2.1967 | 27 20 48.7 | 4.177 |
| 22 | 19 7 29.74 | 2.1939 | 27 16 34.2 | 4.307 |
| 23 | 19 9 41.29 | 2.1911 | 27 12 11.9 | 4.436 |
| 21 | 19 11 52.67 | 2.1882 | S.27 7 41.9 | 4.564 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | **FRIDAY 9.** | | | | | **SUNDAY 11.** | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 19 11 52.67 | 2.1882 | S.27 7 41.9 | 4.564 | 0 | 20 52 52.09 | 2.0132 | S.21 13 33.5 | 9.917 |
| 1 | 19 14 3.87 | 2.1852 | 27 3 4.2 | 4.691 | 1 | 20 54 52.77 | 2.0095 | 21 3 35.7 | 10.010 |
| 2 | 19 16 14.89 | 2.1822 | 26 58 19.0 | 4.817 | 2 | 20 56 53.23 | 2.0057 | 20 53 32.3 | 10.102 |
| 3 | 19 18 25.74 | 2.1792 | 26 53 26.2 | 4.943 | 3 | 20 58 53.46 | 2.0020 | 20 43 23.4 | 10.194 |
| 4 | 19 20 36.40 | 2.1761 | 26 48 25.8 | 5.069 | 4 | 21 0 53.47 | 1.9983 | 20 33 9.0 | 10.285 |
| 5 | 19 22 46.87 | 2.1729 | 26 43 17.9 | 5.194 | 5 | 21 2 53.26 | 1.9947 | 20 22 49.2 | 10.374 |
| 6 | 19 24 57.15 | 2.1697 | 26 38 2.5 | 5.319 | 6 | 21 4 52.84 | 1.9912 | 20 12 24.1 | 10.463 |
| 7 | 19 27 7.23 | 2.1664 | 26 32 39.6 | 5.443 | 7 | 21 6 52.20 | 1.9875 | 20 1 53.6 | 10.552 |
| 8 | 19 29 17.12 | 2.1632 | 26 27 9.3 | 5.566 | 8 | 21 8 51.34 | 1.9839 | 19 51 17.8 | 10.641 |
| 9 | 19 31 26.81 | 2.1598 | 26 21 31.7 | 5.689 | 9 | 21 10 50.27 | 1.9804 | 19 40 36.7 | 10.728 |
| 10 | 19 33 36.30 | 2.1564 | 26 15 46.7 | 5.811 | 10 | 21 12 48.99 | 1.9769 | 19 29 50.4 | 10.814 |
| 11 | 19 35 45.58 | 2.1530 | 26 9 54.4 | 5.932 | 11 | 21 14 47.50 | 1.9735 | 19 18 59.0 | 10.898 |
| 12 | 19 37 54.66 | 2.1496 | 26 3 54.8 | 6.053 | 12 | 21 16 45.81 | 1.9701 | 19 8 2.6 | 10.983 |
| 13 | 19 40 3.53 | 2.1461 | 25 57 48.0 | 6.173 | 13 | 21 18 43.91 | 1.9667 | 18 57 1.1 | 11.068 |
| 14 | 19 42 12.19 | 2.1425 | 25 51 34.0 | 6.293 | 14 | 21 20 41.81 | 1.9633 | 18 45 54.5 | 11.151 |
| 15 | 19 44 20.63 | 2.1389 | 25 45 12.9 | 6.411 | 15 | 21 22 39.51 | 1.9600 | 18 34 43.0 | 11.233 |
| 16 | 19 46 28.86 | 2.1353 | 25 38 44.7 | 6.528 | 16 | 21 24 37.01 | 1.9567 | 18 23 26.6 | 11.314 |
| 17 | 19 48 36.87 | 2.1317 | 25 32 9.5 | 6.646 | 17 | 21 26 34.31 | 1.9534 | 18 12 5.3 | 11.395 |
| 18 | 19 50 44.66 | 2.1280 | 25 25 27.2 | 6.763 | 18 | 21 28 31.42 | 1.9502 | 18 0 39.2 | 11.475 |
| 19 | 19 52 52.23 | 2.1243 | 25 18 37.9 | 6.879 | 19 | 21 30 28.34 | 1.9471 | 17 49 8.3 | 11.555 |
| 20 | 19 54 59.58 | 2.1207 | 25 11 41.7 | 6.994 | 20 | 21 32 25.07 | 1.9440 | 17 37 32.6 | 11.634 |
| 21 | 19 57 6.71 | 2.1169 | 25 4 38.7 | 7.108 | 21 | 21 34 21.62 | 1.9410 | 17 25 52.2 | 11.712 |
| 22 | 19 59 13.61 | 2.1132 | 24 57 28.8 | 7.222 | 22 | 21 36 17.99 | 1.9380 | 17 14 7.2 | 11.788 |
| 23 | 20 1 20.29 | 2.1094 | S.24 50 12.1 | 7.335 | 23 | 21 38 14.18 | 1.9349 | S.17 2 17.6 | 11.864 |
| | **SATURDAY 10.** | | | | | **MONDAY 12.** | | | |
| 0 | 20 3 26.74 | 2.1056 | S.24 42 48.6 | 7.447 | 0 | 21 40 10.18 | 1.9319 | S.16 50 23.5 | 11.939 |
| 1 | 20 5 32.96 | 2.1017 | 24 35 18.4 | 7.559 | 1 | 21 42 6.01 | 1.9291 | 16 38 24.9 | 12.014 |
| 2 | 20 7 38.95 | 2.0979 | 24 27 41.5 | 7.670 | 2 | 21 44 1.67 | 1.9263 | 16 26 21.8 | 12.088 |
| 3 | 20 9 44.71 | 2.0941 | 24 19 58.0 | 7.780 | 3 | 21 45 57.17 | 1.9236 | 16 14 14.3 | 12.162 |
| 4 | 20 11 50.24 | 2.0902 | 24 12 7.9 | 7.889 | 4 | 21 47 52.50 | 1.9208 | 16 2 2.4 | 12.234 |
| 5 | 20 13 55.54 | 2.0864 | 24 4 11.3 | 7.997 | 5 | 21 49 47.67 | 1.9182 | 15 49 46.2 | 12.306 |
| 6 | 20 16 0.61 | 2.0826 | 23 56 8.2 | 8.105 | 6 | 21 51 42.68 | 1.9155 | 15 37 25.7 | 12.377 |
| 7 | 20 18 5.45 | 2.0787 | 23 47 58.7 | 8.213 | 7 | 21 53 37.53 | 1.9128 | 15 25 1.0 | 12.447 |
| 8 | 20 20 10.05 | 2.0748 | 23 39 42.7 | 8.320 | 8 | 21 55 32.22 | 1.9102 | 15 12 32.1 | 12.517 |
| 9 | 20 22 14.42 | 2.0709 | 23 31 20.3 | 8.426 | 9 | 21 57 26.76 | 1.9078 | 14 59 59.0 | 12.586 |
| 10 | 20 24 18.56 | 2.0670 | 23 22 51.6 | 8.530 | 10 | 21 59 21.16 | 1.9055 | 14 47 21.8 | 12.654 |
| 11 | 20 26 22.46 | 2.0631 | 23 14 16.7 | 8.633 | 11 | 22 1 15.42 | 1.9032 | 14 34 40.6 | 12.721 |
| 12 | 20 28 26.13 | 2.0592 | 23 5 35.6 | 8.737 | 12 | 22 3 9.54 | 1.9009 | 14 21 55.3 | 12.787 |
| 13 | 20 30 29.57 | 2.0553 | 22 56 48.3 | 8.839 | 13 | 22 5 3.53 | 1.8986 | 14 9 6.1 | 12.852 |
| 14 | 20 32 32.77 | 2.0514 | 22 47 54.9 | 8.941 | 14 | 22 6 57.38 | 1.8963 | 13 56 13.0 | 12.918 |
| 15 | 20 34 35.74 | 2.0476 | 22 38 55.4 | 9.042 | 15 | 22 8 51.09 | 1.8942 | 13 43 15.9 | 12.983 |
| 16 | 20 36 38.48 | 2.0437 | 22 29 49.8 | 9.143 | 16 | 22 10 44.68 | 1.8922 | 13 30 15.0 | 13.046 |
| 17 | 20 38 40.99 | 2.0398 | 22 20 38.2 | 9.243 | 17 | 22 12 38.16 | 1.8903 | 13 17 10.4 | 13.108 |
| 18 | 20 40 43.26 | 2.0359 | 22 11 20.7 | 9.341 | 18 | 22 14 31.52 | 1.8883 | 13 4 2.0 | 13.171 |
| 19 | 20 42 45.30 | 2.0321 | 22 1 57.3 | 9.438 | 19 | 22 16 24.76 | 1.8864 | 12 50 49.9 | 13.233 |
| 20 | 20 44 47.11 | 2.0283 | 21 52 28.1 | 9.536 | 20 | 22 18 17.89 | 1.8847 | 12 37 34.1 | 13.293 |
| 21 | 20 46 48.70 | 2.0246 | 21 42 53.0 | 9.633 | 21 | 22 20 10.92 | 1.8829 | 12 24 14.7 | 13.353 |
| 22 | 20 48 50.06 | 2.0208 | 21 33 12.2 | 9.728 | 22 | 22 22 3.84 | 1.8812 | 12 10 51.7 | 13.412 |
| 23 | 20 50 51.19 | 2.0170 | 21 23 25.7 | 9.823 | 23 | 22 23 56.66 | 1.8796 | 11 57 25.2 | 13.471 |
| 24 | 20 52 52.09 | 2.0132 | S.21 13 33.5 | 9.917 | 24 | 22 25 49.39 | 1.8781 | S.11 43 55.2 | 13.529 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### TUESDAY 13.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 22 25 49.39 | 1.8781 | S. 11 43 55.2 | 13.529 |
| 1 | 22 27 42.03 | 1.8766 | 11 30 21.7 | 13.586 |
| 2 | 22 29 34.58 | 1.8752 | 11 16 44.9 | 13.642 |
| 3 | 22 31 27.05 | 1.8739 | 11 3 4.7 | 13.697 |
| 4 | 22 33 19.44 | 1.8726 | 10 49 21.2 | 13.752 |
| 5 | 22 35 11.76 | 1.8713 | 10 35 34.5 | 13.806 |
| 6 | 22 37 4.00 | 1.8702 | 10 21 44.5 | 13.860 |
| 7 | 22 38 56.18 | 1.8692 | 10 7 51.3 | 13.912 |
| 8 | 22 40 48.30 | 1.8682 | 9 53 55.0 | 13.963 |
| 9 | 22 42 40.36 | 1.8672 | 9 39 55.7 | 14.014 |
| 10 | 22 44 32.37 | 1.8664 | 9 25 53.3 | 14.065 |
| 11 | 22 46 24.33 | 1.8657 | 9 11 47.9 | 14.115 |
| 12 | 22 48 16.25 | 1.8650 | 8 57 39.5 | 14.164 |
| 13 | 22 50 8.13 | 1.8643 | 8 43 28.2 | 14.212 |
| 14 | 22 51 59.97 | 1.8637 | 8 29 14.1 | 14.259 |
| 15 | 22 53 51.77 | 1.8632 | 8 14 57.1 | 14.306 |
| 16 | 22 55 43.55 | 1.8628 | 8 0 37.3 | 14.352 |
| 17 | 22 57 35.31 | 1.8626 | 7 46 14.8 | 14.397 |
| 18 | 22 59 27.06 | 1.8624 | 7 31 49.7 | 14.441 |
| 19 | 23 1 18.79 | 1.8622 | 7 17 21.9 | 14.485 |
| 20 | 23 3 10.52 | 1.8621 | 7 2 51.5 | 14.527 |
| 21 | 23 5 2.24 | 1.8620 | 6 48 18.6 | 14.569 |
| 22 | 23 6 53.96 | 1.8621 | 6 33 43.2 | 14.611 |
| 23 | 23 8 45.69 | 1.8623 | S. 6 19 5.3 | 14.652 |

### WEDNESDAY 14.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 23 10 37.43 | 1.8625 | S. 6 4 24.9 | 14.692 |
| 1 | 23 12 29.19 | 1.8627 | 5 49 42.2 | 14.731 |
| 2 | 23 14 20.96 | 1.8631 | 5 34 57.2 | 14.769 |
| 3 | 23 16 12.76 | 1.8636 | 5 20 9.9 | 14.807 |
| 4 | 23 18 4.59 | 1.8642 | 5 5 20.4 | 14.843 |
| 5 | 23 19 56.46 | 1.8649 | 4 50 28.7 | 14.879 |
| 6 | 23 21 48.38 | 1.8657 | 4 35 34.9 | 14.914 |
| 7 | 23 23 40.34 | 1.8664 | 4 20 39.0 | 14.948 |
| 8 | 23 25 32.35 | 1.8672 | 4 5 41.1 | 14.982 |
| 9 | 23 27 24.41 | 1.8682 | 3 50 41.2 | 15.015 |
| 10 | 23 29 16.53 | 1.8693 | 3 35 39.3 | 15.047 |
| 11 | 23 31 8.72 | 1.8705 | 3 20 35.5 | 15.078 |
| 12 | 23 33 0.99 | 1.8717 | 3 5 29.9 | 15.108 |
| 13 | 23 34 53.33 | 1.8730 | 2 50 22.5 | 15.137 |
| 14 | 23 36 45.75 | 1.8744 | 2 35 13.4 | 15.166 |
| 15 | 23 38 38.26 | 1.8759 | 2 20 2.6 | 15.194 |
| 16 | 23 40 30.86 | 1.8775 | 2 4 50.1 | 15.222 |
| 17 | 23 42 23.56 | 1.8792 | 1 49 36.0 | 15.248 |
| 18 | 23 44 16.36 | 1.8809 | 1 34 20.4 | 15.273 |
| 19 | 23 46 9.27 | 1.8828 | 1 19 3.3 | 15.297 |
| 20 | 23 48 2.30 | 1.8847 | 1 3 44.8 | 15.320 |
| 21 | 23 49 55.44 | 1.8867 | 0 48 24.9 | 15.343 |
| 22 | 23 51 48.71 | 1.8889 | 0 33 3.6 | 15.365 |
| 23 | 23 53 42.11 | 1.8912 | 0 17 41.1 | 15.385 |
| 24 | 23 55 35.65 | 1.8935 | S. 0 2 17.4 | 15.405 |

### THURSDAY 15.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 23 55 35.65 | 1.8935 | S. 0 2 17.4 | 15.405 |
| 1 | 23 57 29.33 | 1.8959 | N. 0 13 7.5 | 15.424 |
| 2 | 23 59 23.16 | 1.8983 | 0 28 33.5 | 15.442 |
| 3 | 0 1 17.13 | 1.9008 | 0 44 0.5 | 15.459 |
| 4 | 0 3 11.26 | 1.9036 | 0 59 28.5 | 15.475 |
| 5 | 0 5 5.56 | 1.9064 | 1 14 57.5 | 15.490 |
| 6 | 0 7 0.03 | 1.9093 | 1 30 27.3 | 15.503 |
| 7 | 0 8 54.67 | 1.9122 | 1 45 57.9 | 15.517 |
| 8 | 0 10 49.49 | 1.9152 | 2 1 29.3 | 15.530 |
| 9 | 0 12 44.50 | 1.9184 | 2 17 1.5 | 15.542 |
| 10 | 0 14 39.70 | 1.9217 | 2 32 34.3 | 15.551 |
| 11 | 0 16 35.10 | 1.9250 | 2 48 7.6 | 15.559 |
| 12 | 0 18 30.70 | 1.9284 | 3 3 41.4 | 15.567 |
| 13 | 0 20 26.51 | 1.9320 | 3 19 15.7 | 15.575 |
| 14 | 0 22 22.54 | 1.9356 | 3 34 50.4 | 15.581 |
| 15 | 0 24 18.78 | 1.9393 | 3 50 25.4 | 15.586 |
| 16 | 0 26 15.25 | 1.9432 | 4 6 0.7 | 15.590 |
| 17 | 0 28 11.96 | 1.9472 | 4 21 36.2 | 15.592 |
| 18 | 0 30 8.91 | 1.9512 | 4 37 11.7 | 15.593 |
| 19 | 0 32 6.10 | 1.9553 | 4 52 47.3 | 15.594 |
| 20 | 0 34 3.54 | 1.9595 | 5 8 23.0 | 15.594 |
| 21 | 0 36 1.24 | 1.9638 | 5 23 58.6 | 15.592 |
| 22 | 0 37 59.20 | 1.9683 | 5 39 34.1 | 15.589 |
| 23 | 0 39 57.43 | 1.9728 | N. 5 55 9.3 | 15.584 |

### FRIDAY 16.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 0 41 55.93 | 1.9773 | N. 6 10 44.2 | 15.579 |
| 1 | 0 43 54.71 | 1.9821 | 6 26 18.8 | 15.572 |
| 2 | 0 45 53.78 | 1.9869 | 6 41 52.9 | 15.564 |
| 3 | 0 47 53.14 | 1.9918 | 6 57 26.5 | 15.556 |
| 4 | 0 49 52.80 | 1.9969 | 7 12 59.6 | 15.546 |
| 5 | 0 51 52.77 | 2.0020 | 7 28 32.0 | 15.533 |
| 6 | 0 53 53.04 | 2.0072 | 7 44 3.6 | 15.520 |
| 7 | 0 55 53.63 | 2.0126 | 7 59 34.4 | 15.507 |
| 8 | 0 57 54.55 | 2.0180 | 8 15 4.4 | 15.492 |
| 9 | 0 59 55.79 | 2.0235 | 8 30 33.4 | 15.474 |
| 10 | 1 1 57.37 | 2.0291 | 8 46 1.3 | 15.456 |
| 11 | 1 3 59.29 | 2.0348 | 9 1 28.1 | 15.436 |
| 12 | 1 6 1.55 | 2.0406 | 9 16 53.6 | 15.414 |
| 13 | 1 8 4.16 | 2.0466 | 9 32 17.8 | 15.392 |
| 14 | 1 10 7.14 | 2.0527 | 9 47 40.7 | 15.369 |
| 15 | 1 12 10.48 | 2.0588 | 10 3 2.1 | 15.343 |
| 16 | 1 14 14.19 | 2.0650 | 10 18 21.9 | 15.317 |
| 17 | 1 16 18.28 | 2.0714 | 10 33 40.1 | 15.288 |
| 18 | 1 18 22.76 | 2.0778 | 10 48 56.5 | 15.258 |
| 19 | 1 20 27.62 | 2.0843 | 11 4 11.1 | 15.227 |
| 20 | 1 22 32.88 | 2.0910 | 11 19 23.7 | 15.193 |
| 21 | 1 24 38.54 | 2.0977 | 11 34 34.3 | 15.159 |
| 22 | 1 26 44.60 | 2.1045 | 11 49 42.8 | 15.123 |
| 23 | 1 28 51.08 | 2.1115 | 12 4 49.1 | 15.086 |
| 24 | 1 30 57.98 | 2.1186 | N. 12 19 53.1 | 15.047 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | SATURDAY 17. | | | | | MONDAY 19. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 1 30 57.98 | 2.1186 | N.12 19 53.1 | 15.047 | 0 | 3 22 17.66 | 2.5423 | N.23 1 4.7 | 10.860 |
| 1 | 1 33 5.31 | 2.1257 | 12 34 54.7 | 15.006 | 1 | 3 24 50.49 | 2.5520 | 23 11 52.1 | 10.718 |
| 2 | 1 35 13.06 | 2.1328 | 12 49 53.8 | 14.962 | 2 | 3 27 23.90 | 2.5616 | 23 22 30.9 | 10.575 |
| 3 | 1 37 21.24 | 2.1400 | 13 4 50.2 | 14.917 | 3 | 3 29 57.88 | 2.5712 | 23 33 1.1 | 10.429 |
| 4 | 1 39 29.86 | 2.1474 | 13 19 43.9 | 14.872 | 4 | 3 32 32.44 | 2.5807 | 23 43 22.4 | 10.279 |
| 5 | 1 41 38.93 | 2.1550 | 13 34 34.8 | 14.825 | 5 | 3 35 7.57 | 2.5902 | 23 53 34.6 | 10.128 |
| 6 | 1 43 48.46 | 2.1627 | 13 49 22.9 | 14.776 | 6 | 3 37 43.26 | 2.5996 | 24 3 37.7 | 9.975 |
| 7 | 1 45 58.45 | 2.1703 | 14 4 8.0 | 14.725 | 7 | 3 40 19.52 | 2.6090 | 24 13 31.6 | 9.819 |
| 8 | 1 48 8.90 | 2.1780 | 14 18 49.9 | 14.671 | 8 | 3 42 56.34 | 2.6184 | 24 23 16.0 | 9.660 |
| 9 | 1 50 19.81 | 2.1858 | 14 33 28.5 | 14.615 | 9 | 3 45 33.73 | 2.6277 | 24 32 50.8 | 9.500 |
| 10 | 1 52 31.20 | 2.1938 | 14 48 3.7 | 14.558 | 10 | 3 48 11.67 | 2.6369 | 24 42 16.0 | 9.337 |
| 11 | 1 54 43.07 | 2.2018 | 15 2 35.5 | 14.501 | 11 | 3 50 50.16 | 2.6461 | 24 51 31.3 | 9.172 |
| 12 | 1 56 55.42 | 2.2099 | 15 17 3.8 | 14.441 | 12 | 3 53 29.20 | 2.6552 | 25 0 36.6 | 9.004 |
| 13 | 1 59 8.26 | 2.2182 | 15 31 28.4 | 14.378 | 13 | 3 56 8.78 | 2.6641 | 25 9 31.8 | 8.834 |
| 14 | 2 1 21.60 | 2.2265 | 15 45 49.2 | 14.314 | 14 | 3 58 48.89 | 2.6730 | 25 18 16.7 | 8.663 |
| 15 | 2 3 35.44 | 2.2348 | 16 0 6.1 | 14.247 | 15 | 4 1 29.54 | 2.6818 | 25 26 51.3 | 8.489 |
| 16 | 2 5 49.78 | 2.2432 | 16 14 18.9 | 14.179 | 16 | 4 4 10.71 | 2.6904 | 25 35 15.4 | 8.312 |
| 17 | 2 8 4.63 | 2.2518 | 16 28 27.6 | 14.109 | 17 | 4 6 52.39 | 2.6990 | 25 43 28.8 | 8.133 |
| 18 | 2 10 20.00 | 2.2605 | 16 42 32.0 | 14.037 | 18 | 4 9 34.59 | 2.7075 | 25 51 31.4 | 7.952 |
| 19 | 2 12 35.89 | 2.2692 | 16 56 32.0 | 13.963 | 19 | 4 12 17.29 | 2.7158 | 25 59 23.1 | 7.770 |
| 20 | 2 14 52.30 | 2.2778 | 17 10 27.5 | 13.887 | 20 | 4 15 0.49 | 2.7241 | 26 7 3.8 | 7.585 |
| 21 | 2 17 9.23 | 2.2866 | 17 24 18.4 | 13.808 | 21 | 4 17 44.18 | 2.7322 | 26 14 33.3 | 7.397 |
| 22 | 2 19 26.69 | 2.2955 | 17 38 4.5 | 13.727 | 22 | 4 20 28.35 | 2.7401 | 26 21 51.5 | 7.208 |
| 23 | 2 21 44.69 | 2.3046 | N.17 51 45.7 | 13.646 | 23 | 4 23 12.99 | 2.7478 | N.26 28 58.3 | 7.017 |
| | SUNDAY 18. | | | | | TUESDAY 20. | | | |
| 0 | 2 24 3.24 | 2.3137 | N.18 5 22.0 | 13.562 | 0 | 4 25 58.09 | 2.7555 | N.26 35 53.6 | 6.824 |
| 1 | 2 26 22.33 | 2.3228 | 18 18 53.1 | 13.474 | 1 | 4 28 43.65 | 2.7630 | 26 42 37.2 | 6.629 |
| 2 | 2 28 41.97 | 2.3319 | 18 32 18.9 | 13.386 | 2 | 4 31 29.65 | 2.7703 | 26 49 9.1 | 6.432 |
| 3 | 2 31 2.16 | 2.3411 | 18 45 39.4 | 13.295 | 3 | 4 34 16.09 | 2.7775 | 26 55 29.1 | 6.233 |
| 4 | 2 33 22.90 | 2.3503 | 18 58 54.3 | 13.201 | 4 | 4 37 2.95 | 2.7845 | 27 1 37.1 | 6.032 |
| 5 | 2 35 44.19 | 2.3595 | 19 12 3.5 | 13.106 | 5 | 4 39 50.23 | 2.7913 | 27 7 33.0 | 5.829 |
| 6 | 2 38 6.04 | 2.3689 | 19 25 7.0 | 13.009 | 6 | 4 42 37.91 | 2.7979 | 27 13 16.6 | 5.624 |
| 7 | 2 40 28.46 | 2.3784 | 19 38 4.6 | 12.909 | 7 | 4 45 25.98 | 2.8043 | 27 18 47.9 | 5.419 |
| 8 | 2 42 51.45 | 2.3878 | 19 50 56.1 | 12.807 | 8 | 4 48 14.43 | 2.8107 | 27 24 6.9 | 5.212 |
| 9 | 2 45 15.00 | 2.3973 | 20 3 41.4 | 12.702 | 9 | 4 51 3.26 | 2.8168 | 27 29 13.3 | 5.002 |
| 10 | 2 47 39.12 | 2.4069 | 20 16 20.4 | 12.596 | 10 | 4 53 52.44 | 2.8226 | 27 34 7.1 | 4.792 |
| 11 | 2 50 3.82 | 2.4165 | 20 28 52.9 | 12.488 | 11 | 4 56 41.97 | 2.8283 | 27 38 48.3 | 4.580 |
| 12 | 2 52 29.10 | 2.4261 | 20 41 18.9 | 12.377 | 12 | 4 59 31.83 | 2.8337 | 27 43 16.7 | 4.366 |
| 13 | 2 54 54.95 | 2.4357 | 20 53 38.1 | 12.263 | 13 | 5 2 22.01 | 2.8388 | 27 47 32.2 | 4.151 |
| 14 | 2 57 21.38 | 2.4453 | 21 5 50.4 | 12.147 | 14 | 5 5 12.49 | 2.8438 | 27 51 34.8 | 3.934 |
| 15 | 2 59 48.39 | 2.4550 | 21 17 55.7 | 12.029 | 15 | 5 8 3.27 | 2.8487 | 27 55 24.3 | 3.716 |
| 16 | 3 2 15.98 | 2.4647 | 21 29 53.9 | 11.909 | 16 | 5 10 54.33 | 2.8532 | 27 59 0.7 | 3.497 |
| 17 | 3 4 44.15 | 2.4743 | 21 41 44.8 | 11.786 | 17 | 5 13 45.65 | 2.8575 | 28 2 24.0 | 3.277 |
| 18 | 3 7 12.90 | 2.4841 | 21 53 28.2 | 11.661 | 18 | 5 16 37.23 | 2.8616 | 28 5 34.0 | 3.056 |
| 19 | 3 9 42.24 | 2.4938 | 22 5 4.1 | 11.533 | 19 | 5 19 29.04 | 2.8653 | 28 8 30.7 | 2.834 |
| 20 | 3 12 12.16 | 2.5035 | 22 16 32.2 | 11.403 | 20 | 5 22 21.07 | 2.8689 | 28 11 14.1 | 2.612 |
| 21 | 3 14 42.66 | 2.5132 | 22 27 52.5 | 11.271 | 21 | 5 25 13.31 | 2.8722 | 28 13 44.1 | 2.388 |
| 22 | 3 17 13.74 | 2.5229 | 22 39 4.8 | 11.137 | 22 | 5 28 5.74 | 2.8753 | 28 16 0.6 | 2.162 |
| 23 | 3 19 45.41 | 2.5326 | 22 50 8.9 | 10.999 | 23 | 5 30 58.35 | 2.8782 | 28 18 3.5 | 1.936 |
| 24 | 3 22 17.66 | 2.5423 | N.23 1 4.7 | 10.860 | 24 | 5 33 51.12 | 2.8807 | N.28 19 52.9 | 1.710 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### WEDNESDAY 21.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 5 33 51.12 | 2.8807 | N.28 19 52.9 | 1.710 |
| 1 | 5 36 44.04 | 2.8830 | 28 21 28.7 | 1.483 |
| 2 | 5 39 37.08 | 2.8850 | 28 22 50.8 | 1.255 |
| 3 | 5 42 30.24 | 2.8868 | 28 23 59.3 | 1.027 |
| 4 | 5 45 23.50 | 2.8884 | 28 24 54.1 | 0.798 |
| 5 | 5 48 16.85 | 2.8897 | 28 25 35.1 | 0.569 |
| 6 | 5 51 10.26 | 2.8906 | 28 26 2.4 | 0.340 |
| 7 | 5 54 3.72 | 2.8913 | 28 26 15.9 | +0.110 |
| 8 | 5 56 57.22 | 2.8918 | 22 26 15.6 | −0.119 |
| 9 | 5 59 50.74 | 2.8920 | 28 26 1.6 | 0.348 |
| 10 | 6 2 44.26 | 2.8919 | 28 25 33.8 | 0.578 |
| 11 | 6 5 37.77 | 2.8916 | 28 24 52.2 | 0.808 |
| 12 | 6 8 31.25 | 2.8909 | 28 23 56.8 | 1.037 |
| 13 | 6 11 24.68 | 2.8900 | 28 22 47.7 | 1.267 |
| 14 | 6 14 18.05 | 2.8889 | 28 21 24.8 | 1.496 |
| 15 | 6 17 11.35 | 2.8876 | 28 19 48.2 | 1.724 |
| 16 | 6 20 4.56 | 2.8859 | 28 17 57.9 | 1.952 |
| 17 | 6 22 57.65 | 2.8838 | 28 15 53.9 | 2.180 |
| 18 | 6 25 50.62 | 2.8816 | 28 13 36.3 | 2.407 |
| 19 | 6 28 43.45 | 2.8792 | 28 11 5.1 | 2.633 |
| 20 | 6 31 36.12 | 2.8765 | 28 8 20.3 | 2.859 |
| 21 | 6 34 28.63 | 2.8736 | 28 5 22.0 | 3.084 |
| 22 | 6 37 20.95 | 2.8703 | 28 2 10.2 | 3.308 |
| 23 | 6 40 13.07 | 2.8669 | N.27 58 45.0 | 3.531 |

### THURSDAY 22.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 6 43 4.98 | 2.8632 | N.27 55 6.5 | 3.752 |
| 1 | 6 45 56.66 | 2.8593 | 27 51 14.7 | 3.974 |
| 2 | 6 48 48.10 | 2.8551 | 27 47 9.6 | 4.195 |
| 3 | 6 51 39.27 | 2.8506 | 27 42 51.3 | 4.414 |
| 4 | 6 54 30.17 | 2.8460 | 27 38 19.9 | 4.632 |
| 5 | 6 57 20.79 | 2.8412 | 27 33 35.5 | 4.848 |
| 6 | 7 0 11.11 | 2.8361 | 27 28 38.2 | 5.063 |
| 7 | 7 3 1.12 | 2.8308 | 27 23 28.0 | 5.277 |
| 8 | 7 5 50.81 | 2.8253 | 27 18 5.0 | 5.489 |
| 9 | 7 8 40.16 | 2.8197 | 27 12 29.3 | 5.700 |
| 10 | 7 11 29.17 | 2.8137 | 27 6 41.0 | 5.909 |
| 11 | 7 14 17.81 | 2.8076 | 27 0 40.2 | 6.116 |
| 12 | 7 17 6.08 | 2.8013 | 26 54 27.1 | 6.322 |
| 13 | 7 19 53.97 | 2.7948 | 26 48 1.6 | 6.527 |
| 14 | 7 22 41.46 | 2.7881 | 26 41 23.9 | 6.729 |
| 15 | 7 25 28.54 | 2.7812 | 26 34 34.1 | 6.930 |
| 16 | 7 28 15.21 | 2.7743 | 26 27 32.3 | 7.128 |
| 17 | 7 31 1.46 | 2.7672 | 26 20 18.7 | 7.325 |
| 18 | 7 33 47.27 | 2.7598 | 26 12 53.3 | 7.520 |
| 19 | 7 36 32.64 | 2.7523 | 26 5 16.3 | 7.713 |
| 20 | 7 39 17.55 | 2.7447 | 25 57 27.8 | 7.904 |
| 21 | 7 42 2.00 | 2.7369 | 25 49 27.8 | 8.093 |
| 22 | 7 44 45.98 | 2.7290 | 25 41 16.6 | 8.280 |
| 23 | 7 47 29.48 | 2.7210 | 25 32 54.2 | 8.465 |
| 24 | 7 50 12.50 | 2.7129 | N.25 24 20.8 | 8.647 |

### FRIDAY 23.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 7 50 12.50 | 2.7129 | N.25 24 20.8 | 8.647 |
| 1 | 7 52 55.03 | 2.7046 | 25 15 36.5 | 8.827 |
| 2 | 7 55 37.05 | 2.6962 | 25 6 41.5 | 9.006 |
| 3 | 7 58 18.57 | 2.6877 | 24 57 35.8 | 9.182 |
| 4 | 8 0 59.58 | 2.6792 | 24 48 19.6 | 9.356 |
| 5 | 8 3 40.07 | 2.6705 | 24 38 53.1 | 9.527 |
| 6 | 8 6 20.04 | 2.6617 | 24 29 16.3 | 9.697 |
| 7 | 8 8 59.48 | 2.6528 | 24 19 29.4 | 9.864 |
| 8 | 8 11 38.38 | 2.6439 | 24 9 32.6 | 10.028 |
| 9 | 8 14 16.75 | 2.6350 | 23 59 26.0 | 10.191 |
| 10 | 8 16 54.58 | 2.6259 | 23 49 9.7 | 10.351 |
| 11 | 8 19 31.86 | 2.6168 | 23 38 43.9 | 10.508 |
| 12 | 8 22 8.59 | 2.6076 | 23 28 8.7 | 10.664 |
| 13 | 8 24 44.77 | 2.5983 | 23 17 24.2 | 10.817 |
| 14 | 8 27 20.39 | 2.5890 | 23 6 30.7 | 10.967 |
| 15 | 8 29 55.45 | 2.5797 | 22 55 28.2 | 11.115 |
| 16 | 8 32 29.96 | 2.5704 | 22 44 16.9 | 11.261 |
| 17 | 8 35 3.90 | 2.5610 | 22 32 56.9 | 11.404 |
| 18 | 8 37 37.28 | 2.5517 | 22 21 28.4 | 11.545 |
| 19 | 8 40 10.10 | 2.5423 | 22 9 51.5 | 11.683 |
| 20 | 8 42 42.35 | 2.5328 | 21 58 6.4 | 11.819 |
| 21 | 8 45 14.03 | 2.5233 | 21 46 13.2 | 11.953 |
| 22 | 8 47 45.14 | 2.5138 | 21 34 12.0 | 12.084 |
| 23 | 8 50 15.69 | 2.5044 | N.21 22 3.1 | 12.213 |

### SATURDAY 24.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 8 52 45.67 | 2.4949 | N.21 9 46.5 | 12.339 |
| 1 | 8 55 15.08 | 2.4855 | 20 57 22.4 | 12.462 |
| 2 | 8 57 43.93 | 2.4761 | 20 44 51.0 | 12.584 |
| 3 | 9 0 12.21 | 2.4667 | 20 32 12.3 | 12.704 |
| 4 | 9 2 39.93 | 2.4573 | 20 19 26.5 | 12.821 |
| 5 | 9 5 7.09 | 2.4479 | 20 6 33.8 | 12.934 |
| 6 | 9 7 33.68 | 2.4385 | 19 53 34.4 | 13.046 |
| 7 | 9 9 59.71 | 2.4292 | 19 40 28.3 | 13.156 |
| 8 | 9 12 25.19 | 2.4200 | 19 27 15.7 | 13.263 |
| 9 | 9 14 50.11 | 2.4107 | 19 13 56.7 | 13.368 |
| 10 | 9 17 14.47 | 2.4015 | 19 0 31.5 | 13.471 |
| 11 | 9 19 38.29 | 2.3924 | 18 47 0.2 | 13.571 |
| 12 | 9 22 1.56 | 2.3833 | 18 33 23.0 | 13.669 |
| 13 | 9 24 24.28 | 2.3742 | 18 19 39.9 | 13.765 |
| 14 | 9 26 46.46 | 2.3652 | 18 5 51.2 | 13.858 |
| 15 | 9 29 8.10 | 2.3562 | 17 51 57.0 | 13.948 |
| 16 | 9 31 29.20 | 2.3472 | 17 37 57.4 | 14.037 |
| 17 | 9 33 49.77 | 2.3383 | 17 23 52.5 | 14.125 |
| 18 | 9 36 9.80 | 2.3295 | 17 9 42.4 | 14.210 |
| 19 | 9 38 29.31 | 2.3208 | 16 55 27.3 | 14.292 |
| 20 | 9 40 48.30 | 2.3122 | 16 41 7.4 | 14.371 |
| 21 | 9 43 6.77 | 2.3036 | 16 26 42.8 | 14.449 |
| 22 | 9 45 24.73 | 2.2951 | 16 12 13.5 | 14.526 |
| 23 | 9 47 42.18 | 2.2867 | 15 57 39.7 | 14.599 |
| 24 | 9 49 59.13 | 2.2783 | N.15 43 1.6 | 14.671 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | SUNDAY 25. | | | | | TUESDAY 27. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 9 49 59.13 | 2.2783 | N.15 43 1.6 | 14.671 | 0 | 11 31 25.01 | 1.9855 | N. 3 11 37.2 | 16.018 |
| 1 | 9 52 15.58 | 2.2700 | 15 28 19.2 | 14.740 | 1 | 11 33 24.03 | 1.9819 | 2 55 36.3 | 16.011 |
| 2 | 9 54 31.53 | 2.2618 | 15 13 32.8 | 14.807 | 2 | 11 35 22.84 | 1.9784 | 2 39 35.9 | 16.002 |
| 3 | 9 56 46.99 | 2.2537 | 14 58 42.4 | 14.872 | 3 | 11 37 21.44 | 1.9749 | 2 23 36.1 | 15.992 |
| 4 | 9 59 1.97 | 2.2457 | 14 43 48.1 | 14.936 | 4 | 11 39 19.83 | 1.9715 | 2 7 36.9 | 15.981 |
| 5 | 10 1 16.47 | 2.2377 | 14 28 50.1 | 14.997 | 5 | 11 41 18.02 | 1.9682 | 1 51 38.4 | 15.968 |
| 6 | 10 3 30.49 | 2.2298 | 14 13 48.4 | 15.057 | 6 | 11 43 16.02 | 1.9651 | 1 35 40.7 | 15.955 |
| 7 | 10 5 44.04 | 2.2220 | 13 58 43.2 | 15.114 | 7 | 11 45 13.83 | 1.9620 | 1 19 43.8 | 15.941 |
| 8 | 10 7 57.13 | 2.2143 | 13 43 34.7 | 15.169 | 8 | 11 47 11.46 | 1.9590 | 1 3 47.8 | 15.925 |
| 9 | 10 10 9.76 | 2.2067 | 13 28 22.9 | 15.223 | 9 | 11 49 8.91 | 1.9562 | 0 47 52.8 | 15.907 |
| 10 | 10 12 21.93 | 2.1991 | 13 13 7.9 | 15.275 | 10 | 11 51 6.20 | 1.9534 | 0 31 58.9 | 15.889 |
| 11 | 10 14 33.65 | 2.1917 | 12 57 49.9 | 15.324 | 11 | 11 53 3.32 | 1.9507 | 0 16 6.1 | 15.870 |
| 12 | 10 16 44.93 | 2.1844 | 12 42 29.0 | 15.372 | 12 | 11 55 0.28 | 1.9481 | N. 0 0 14.5 | 15.850 |
| 13 | 10 18 55.78 | 2.1771 | 12 27 5.3 | 15.418 | 13 | 11 56 57.09 | 1.9457 | S. 0 15 35.9 | 15.829 |
| 14 | 10 21 6.19 | 2.1699 | 12 11 38.8 | 15.463 | 14 | 11 58 53.76 | 1.9432 | 0 31 25.0 | 15.807 |
| 15 | 10 23 16.17 | 2.1628 | 11 56 9.7 | 15.506 | 15 | 12 0 50.28 | 1.9408 | 0 47 12.7 | 15.784 |
| 16 | 10 25 25.73 | 2.1559 | 11 40 38.1 | 15.546 | 16 | 12 2 46.66 | 1.9387 | 1 2 59.0 | 15.760 |
| 17 | 10 27 34.88 | 2.1491 | 11 25 4.2 | 15.584 | 17 | 12 4 42.92 | 1.9366 | 1 18 43.9 | 15.735 |
| 18 | 10 29 43.62 | 2.1423 | 11 9 28.0 | 15.622 | 18 | 12 6 39.05 | 1.9345 | 1 34 27.2 | 15.708 |
| 19 | 10 31 51.96 | 2.1356 | 10 53 49.6 | 15.657 | 19 | 12 8 35.06 | 1.9326 | 1 50 8.9 | 15.681 |
| 20 | 10 33 59.89 | 2.1289 | 10 38 9.2 | 15.690 | 20 | 12 10 30.96 | 1.9307 | 2 5 48.9 | 15.652 |
| 21 | 10 36 7.43 | 2.1225 | 10 22 26.8 | 15.722 | 21 | 12 12 26.75 | 1.9290 | 2 21 27.2 | 15.623 |
| 22 | 10 38 14.59 | 2.1161 | 10 6 42.5 | 15.752 | 22 | 12 14 22.44 | 1.9273 | 2 37 3.7 | 15.593 |
| 23 | 10 40 21.37 | 2.1098 | N. 9 50 56.5 | 15.781 | 23 | 12 16 18.03 | 1.9257 | S. 2 52 38.4 | 15.562 |
| | MONDAY 26. | | | | | WEDNESDAY 28. | | | |
| 0 | 10 42 27.77 | 2.1037 | N. 9 35 8.8 | 15.808 | 0 | 12 18 13.53 | 1.9242 | S. 3 8 11.2 | 15.531 |
| 1 | 10 44 33.81 | 2.0976 | 9 19 19.5 | 15.834 | 1 | 12 20 8.94 | 1.9228 | 3 23 42.1 | 15.498 |
| 2 | 10 46 39.48 | 2.0916 | 9 3 28.7 | 15.857 | 2 | 12 22 4.27 | 1.9216 | 3 39 10.9 | 15.463 |
| 3 | 10 48 44.80 | 2.0857 | 8 47 36.6 | 15.879 | 3 | 12 23 59.53 | 1.9204 | 3 54 37.6 | 15.428 |
| 4 | 10 50 49.77 | 2.0799 | 8 31 43.2 | 15.901 | 4 | 12 25 54.72 | 1.9192 | 4 10 2.2 | 15.393 |
| 5 | 10 52 54.39 | 2.0742 | 8 15 48.5 | 15.921 | 5 | 12 27 49.84 | 1.9182 | 4 25 24.7 | 15.357 |
| 6 | 10 54 58.68 | 2.0687 | 7 59 52.7 | 15.938 | 6 | 12 29 44.90 | 1.9172 | 4 40 45.0 | 15.319 |
| 7 | 10 57 2.64 | 2.0632 | 7 43 55.9 | 15.954 | 7 | 12 31 39.91 | 1.9164 | 4 56 3.0 | 15.280 |
| 8 | 10 59 6.27 | 2.0578 | 7 27 58.2 | 15.968 | 8 | 12 33 34.87 | 1.9156 | 5 11 18.6 | 15.240 |
| 9 | 11 1 9.58 | 2.0525 | 7 11 59.7 | 15.982 | 9 | 12 35 29.78 | 1.9149 | 5 26 31.8 | 15.200 |
| 10 | 11 3 12.57 | 2.0473 | 6 56 0.4 | 15.994 | 10 | 12 37 24.66 | 1.9143 | 5 41 42.6 | 15.159 |
| 11 | 11 5 15.26 | 2.0423 | 6 40 0.4 | 16.004 | 11 | 12 39 19.50 | 1.9137 | 5 56 50.9 | 15.117 |
| 12 | 11 7 17.65 | 2.0373 | 6 23 59.9 | 16.013 | 12 | 12 41 14.31 | 1.9133 | 6 11 56.7 | 15.075 |
| 13 | 11 9 19.74 | 2.0324 | 6 7 58.9 | 16.621 | 13 | 12 43 9.10 | 1.9130 | 6 26 59.9 | 15.031 |
| 14 | 11 11 21.54 | 2.0277 | 5 51 57.4 | 16.028 | 14 | 12 45 3.87 | 1.9127 | 6 42 0.4 | 14.986 |
| 15 | 11 13 23.07 | 2.0231 | 5 35 55.6 | 16.033 | 15 | 12 46 58.62 | 1.9124 | 6 56 58.2 | 14.940 |
| 16 | 11 15 24.32 | 2.0185 | 5 19 53.5 | 16.036 | 16 | 12 48 53.36 | 1.9123 | 7 11 53.2 | 14.893 |
| 17 | 11 17 25.29 | 2.0139 | 5 3 51.3 | 16.037 | 17 | 12 50 48.10 | 1.9123 | 7 26 45.4 | 14.847 |
| 18 | 11 19 25.99 | 2.0096 | 4 47 49.0 | 16.038 | 18 | 12 52 42.84 | 1.9124 | 7 41 34.8 | 14.799 |
| 19 | 11 21 26.44 | 2.0053 | 4 31 46.7 | 16.038 | 19 | 12 54 37.59 | 1.9125 | 7 56 21.3 | 14.750 |
| 20 | 11 23 26.63 | 2.0012 | 4 15 44.4 | 16.037 | 20 | 12 56 32.34 | 1.9126 | 8 11 4.8 | 14.700 |
| 21 | 11 25 26.58 | 1.9972 | 3 59 42.2 | 16.035 | 21 | 12 58 27.10 | 1.9128 | 8 25 45.3 | 14.650 |
| 22 | 11 27 26.29 | 1.9932 | 3 43 40.2 | 16.031 | 22 | 13 0 21.88 | 1.9132 | 8 40 22.8 | 14.599 |
| 23 | 11 29 25.77 | 1.9893 | 3 27 38.5 | 16.025 | 23 | 13 2 16.69 | 1.9137 | 8 54 57.2 | 14.547 |
| 24 | 11 31 25.01 | 1.9855 | N. 3 11 37.2 | 16.018 | 24 | 13 4 11.53 | 1.9142 | S. 9 9 28.4 | 14.493 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| THURSDAY 29. | | | | | FRIDAY 30. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 13 4 11.53 | 1.9142 | S. 9 9 28.4 | 14.493 | 0 | 13 50 27.23 | 1.9474 | S. 14 40 6.6 | 12.983 |
| 1 | 13 6 6.40 | 1.9148 | 9 23 56.4 | 14.440 | 1 | 13 52 24.14 | 1.9496 | 14 53 3.4 | 12.911 |
| 2 | 13 8 1.31 | 1.9154 | 9 38 21.2 | 14.386 | 2 | 13 54 21.18 | 1.9518 | 15 5 55.9 | 12.838 |
| 3 | 13 9 56.25 | 1.9161 | 9 52 42.7 | 14.330 | 3 | 13 56 18.35 | 1.9540 | 15 18 43.9 | 12.763 |
| 4 | 13 11 51.24 | 1.9170 | 10 7 0.8 | 14.273 | 4 | 13 58 15.66 | 1.9564 | 15 31 27.4 | 12.688 |
| 5 | 13 13 46.29 | 1.9179 | 10 21 15.5 | 14.216 | 5 | 14 0 13.12 | 1.9588 | 15 44 6.4 | 12.612 |
| 6 | 13 15 41.39 | 1.9188 | 10 35 26.8 | 14.159 | 6 | 14 2 10.72 | 1.9612 | 15 56 40.8 | 12.535 |
| 7 | 13 17 36.55 | 1.9198 | 10 49 34.6 | 14.101 | 7 | 14 4 8.47 | 1.9637 | 16 9 10.6 | 12.457 |
| 8 | 13 19 31.77 | 1.9209 | 11 3 38.9 | 14.041 | 8 | 14 6 6.37 | 1.9662 | 16 21 35.7 | 12.379 |
| 9 | 13 21 27.06 | 1.9221 | 11 17 39.5 | 13.980 | 9 | 14 8 4.42 | 1.9688 | 16 33 56.1 | 12.300 |
| 10 | 13 23 22.42 | 1.9233 | 11 31 36.5 | 13.919 | 10 | 14 10 2.63 | 1.9715 | 16 46 11.7 | 12.220 |
| 11 | 13 25 17.86 | 1.9246 | 11 45 29.8 | 13.858 | 11 | 14 12 1.00 | 1.9742 | 16 58 22.5 | 12.140 |
| 12 | 13 27 13.37 | 1.9259 | 11 59 19.4 | 13.796 | 12 | 14 13 59.53 | 1.9769 | 17 10 28.5 | 12.059 |
| 13 | 13 29 8.97 | 1.9274 | 12 13 5.3 | 13.733 | 13 | 14 15 58.23 | 1.9797 | 17 22 29.6 | 11.977 |
| 14 | 13 31 4.66 | 1.9289 | 12 26 47.3 | 13.668 | 14 | 14 17 57.10 | 1.9825 | 17 34 25.7 | 11.893 |
| 15 | 13 33 0.44 | 1.9305 | 12 40 25.4 | 13.603 | 15 | 14 19 56.13 | 1.9853 | 17 46 16.8 | 11.809 |
| 16 | 13 34 56.32 | 1.9321 | 12 53 59.6 | 13.538 | 16 | 14 21 55.34 | 1.9882 | 17 58 2.8 | 11.725 |
| 17 | 13 36 52.29 | 1.9338 | 13 7 29.9 | 13.471 | 17 | 14 23 54.72 | 1.9912 | 18 9 43.8 | 11.641 |
| 18 | 13 38 48.37 | 1.9356 | 13 20 56.1 | 13.403 | 18 | 14 25 54.28 | 1.9942 | 18 21 19.7 | 11.555 |
| 19 | 13 40 44.56 | 1.9374 | 13 34 18.3 | 13.336 | 19 | 14 27 54.02 | 1.9972 | 18 32 50.4 | 11.468 |
| 20 | 13 42 40.86 | 1.9393 | 13 47 36.4 | 13.267 | 20 | 14 29 53.95 | 2.0003 | 18 44 15.8 | 11.380 |
| 21 | 13 44 37.27 | 1.9412 | 14 0 50.3 | 13.197 | 21 | 14 31 54.06 | 2.0034 | 18 55 36.0 | 11.292 |
| 22 | 13 46 33.80 | 1.9432 | 14 14 0.0 | 13.126 | 22 | 14 33 54.36 | 2.0066 | 19 6 50.9 | 11.203 |
| 23 | 13 48 30.45 | 1.9453 | 14 27 5.4 | 13.055 | 23 | 14 35 54.85 | 2.0097 | 19 18 0.4 | 11.112 |
| 24 | 13 50 27.23 | 1.9474 | S. 14 40 6.6 | 12.983 | 24 | 14 37 55.53 | 2.0129 | S. 19 29 4.4 | 11.021 |

## PHASES OF THE MOON.

| | d | h | m |
|---|---|---|---|
| ○ Full Moon, . . . . . . . . . . | 6 | 12 | 37.4 |
| ☾ Last Quarter, . . . . . . . . . . | 14 | 15 | 14.5 |
| ● New Moon, . . . . . . . . . . | 21 | 10 | 17.0 |
| ☽ First Quarter, . . . . . . . . . . | 28 | 3 | 14.1 |

| | d | h |
|---|---|---|
| ☾ Apogee, . . . . . . . . . . . . . . | 8 | 9.9 |
| ☾ Perigee, . . . . . . . . . . . . . . | 21 | 15.6 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun | W. | 117° 25′ 40″ | 3091 | 118° 54′ 1″ | 3104 | 120° 22′ 6″ | 3116 | 121° 49′ 56″ | 3129 |
| | Pollux | W. | 77 25 12 | 2735 | 79 1 6 | 2745 | 80 36 46 | 2756 | 82 12 11 | 2768 |
| | Venus | W. | 75 49 27 | 2953 | 77 20 39 | 2964 | 78 51 37 | 2974 | 80 22 22 | 2985 |
| | Regulus | W. | 40 37 19 | 2737 | 42 13 10 | 2748 | 43 48 46 | 2759 | 45 24 8 | 2769 |
| | Jupiter | E. | 46 38 32 | 2728 | 45 2 30 | 2742 | 43 26 46 | 2755 | 41 51 19 | 2769 |
| | Antares | E. | 59 21 2 | 2732 | 57 45 4 | 2743 | 56 9 21 | 2753 | 54 33 52 | 2765 |
| | α Aquilæ | E. | 109 3 39 | 3626 | 107 45 33 | 3621 | 106 27 21 | 3617 | 105 9 5 | 3615 |
| 2 | Sun | W. | 129 5 25 | 3188 | 130 31 48 | 3200 | 131 57 57 | 3211 | 133 23 53 | 3222 |
| | Pollux | W. | 90 5 47 | 2818 | 91 39 51 | 2828 | 93 13 43 | 2837 | 94 47 23 | 2845 |
| | Venus | W. | 87 52 57 | 3034 | 89 22 28 | 3043 | 90 51 48 | 3052 | 92 20 57 | 3060 |
| | Regulus | W. | 53 17 38 | 2818 | 54 51 42 | 2828 | 56 25 33 | 2837 | 57 59 13 | 2846 |
| | Antares | E. | 46 39 56 | 2815 | 45 5 48 | 2825 | 43 31 52 | 2834 | 41 58 8 | 2843 |
| | α Aquilæ | E. | 98 37 34 | 3620 | 97 19 21 | 3623 | 96 1 12 | 3628 | 94 43 8 | 3634 |
| 3 | Pollux | W. | 102 32 54 | 2888 | 104 5 28 | 2896 | 105 37 52 | 2904 | 107 10 6 | 2912 |
| | Venus | W. | 99 44 10 | 3100 | 101 12 20 | 3107 | 102 40 21 | 3114 | 104 8 13 | 3121 |
| | Regulus | W. | 65 44 43 | 2888 | 67 17 17 | 2895 | 68 49 42 | 2903 | 70 21 57 | 2911 |
| | Antares | E. | 34 12 19 | 2885 | 32 39 41 | 2894 | 31 7 14 | 2901 | 29 34 56 | 2909 |
| | α Aquilæ | E. | 88 14 32 | 3672 | 86 57 15 | 3682 | 85 40 9 | 3693 | 84 23 14 | 3705 |
| 4 | Venus | W. | 111 25 33 | 3153 | 112 52 39 | 3159 | 114 19 37 | 3165 | 115 46 28 | 3170 |
| | Regulus | W. | 78 0 53 | 2946 | 79 32 14 | 2951 | 81 3 28 | 2958 | 82 34 34 | 2964 |
| | Spica | W. | 23 58 46 | 2943 | 25 30 11 | 2950 | 27 1 27 | 2956 | 28 32 35 | 2962 |
| | α Aquilæ | E. | 78 2 3 | 3775 | 76 46 35 | 3792 | 75 31 24 | 3810 | 74 16 32 | 3828 |
| | Fomalhaut | E. | 103 29 9 | 3200 | 102 3 0 | 3204 | 100 36 56 | 3208 | 99 10 56 | 3211 |
| | Saturn | E. | 111 41 50 | 2950 | 110 10 35 | 2957 | 108 39 28 | 2963 | 107 8 29 | 2969 |
| 5 | Regulus | W. | 90 8 12 | 2992 | 91 38 35 | 2997 | 93 8 52 | 3002 | 94 39 2 | 3007 |
| | Spica | W. | 36 6 28 | 2989 | 37 36 54 | 2994 | 39 7 14 | 3000 | 40 37 27 | 3005 |
| | α Aquilæ | E. | 68 7 24 | 3941 | 66 54 46 | 3967 | 65 42 34 | 3997 | 64 30 51 | 4027 |
| | Fomalhaut | E. | 92 2 10 | 3235 | 90 36 42 | 3239 | 89 11 19 | 3245 | 87 46 3 | 3250 |
| | Saturn | E. | 99 35 24 | 2997 | 98 5 7 | 3002 | 96 34 57 | 3007 | 95 4 53 | 3011 |
| | α Pegasi | E. | 113 40 14 | 3301 | 112 16 4 | 3300 | 110 51 52 | 3299 | 109 27 39 | 3298 |
| 6 | Regulus | W. | 102 8 27 | 3029 | 103 38 4 | 3033 | 105 7 36 | 3036 | 106 37 4 | 3040 |
| | Spica | W. | 48 7 6 | 3026 | 49 36 46 | 3031 | 51 6 21 | 3035 | 52 35 51 | 3038 |
| | Jupiter | W. | 16 34 58 | 3210 | 18 0 55 | 3180 | 19 27 28 | 3158 | 20 54 27 | 3140 |
| | α Aquilæ | E. | 58 40 18 | 4210 | 57 32 1 | 4253 | 56 24 25 | 4301 | 55 17 33 | 4351 |
| | Fomalhaut | E. | 80 41 21 | 3280 | 79 16 46 | 3286 | 77 52 18 | 3293 | 76 27 58 | 3300 |
| | Saturn | E. | 87 35 56 | 3034 | 86 6 25 | 3037 | 84 36 58 | 3041 | 83 7 36 | 3044 |
| | α Pegasi | E. | 102 26 28 | 3299 | 101 2 15 | 3300 | 99 38 4 | 3302 | 98 13 55 | 3303 |
| 7 | Spica | W. | 60 2 20 | 3053 | 61 31 27 | 3056 | 63 0 30 | 3059 | 64 29 30 | 3061 |
| | Jupiter | W. | 28 13 23 | 3096 | 29 41 38 | 3091 | 31 9 59 | 3087 | 32 38 24 | 3085 |
| | α Aquilæ | E. | 49 55 48 | 4668 | 48 54 21 | 4747 | 47 54 1 | 4832 | 46 54 51 | 4925 |
| | Fomalhaut | E. | 69 28 27 | 3338 | 68 5 0 | 3348 | 66 41 44 | 3357 | 65 18 38 | 3365 |
| | Saturn | E. | 75 41 46 | 3060 | 74 12 47 | 3062 | 72 43 51 | 3065 | 71 14 59 | 3067 |
| | α Pegasi | E. | 91 13 38 | 3313 | 89 49 42 | 3317 | 88 25 50 | 3319 | 87 2 1 | 3322 |
| 8 | Spica | W. | 71 53 52 | 3070 | 73 22 38 | 3071 | 74 51 23 | 3072 | 76 20 7 | 3073 |
| | Jupiter | W. | 40 1 13 | 3075 | 41 29 53 | 3074 | 42 58 35 | 3073 | 44 27 18 | 3072 |
| | Antares | W. | 25 59 29 | 3070 | 27 28 15 | 3071 | 28 57 0 | 3073 | 30 25 43 | 3073 |
| | Fomalhaut | E. | 58 26 2 | 3423 | 57 4 11 | 3436 | 55 42 35 | 3449 | 54 21 14 | 3465 |
| | Saturn | E. | 63 51 13 | 3075 | 62 22 33 | 3077 | 60 53 55 | 3078 | 59 25 18 | 3078 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun | W. | 123° 17′ 31″ | 3141 | 124° 44′ 51″ | 3153 | 126° 11′ 57″ | 3165 | 127° 38′ 48″ | 3177 |
| | Pollux | W. | 83 47 21 | 2779 | 85 22 17 | 2789 | 86 57 0 | 2798 | 88 31 30 | 2808 |
| | Venus | W. | 81 52 54 | 2995 | 83 23 13 | 3005 | 84 53 20 | 3015 | 86 23 14 | 3024 |
| | Regulus | W. | 46 59 17 | 2779 | 48 34 12 | 2790 | 50 8 53 | 2799 | 51 43 22 | 2809 |
| | Jupiter | E. | 40 16 10 | 2782 | 38 41 18 | 2796 | 37 6 45 | 2810 | 35 32 30 | 2824 |
| | Antares | E. | 52 58 38 | 2776 | 51 23 38 | 2785 | 49 48 51 | 2795 | 48 14 17 | 2805 |
| | α Aquilæ | E. | 103 50 47 | 3613 | 102 32 27 | 3614 | 101 14 8 | 3615 | 99 55 50 | 3617 |
| 2 | Sun | W. | 134 49 36 | 3233 | 136 15 6 | 3245 | 137 40 22 | 3256 | 139 5 25 | 3266 |
| | Pollux | W. | 96 20 52 | 2855 | 97 54 9 | 2863 | 99 27 15 | 2872 | 101 0 10 | 2880 |
| | Venus | W. | 93 49 56 | 3069 | 95 18 44 | 3077 | 96 47 22 | 3084 | 98 15 51 | 3092 |
| | Regulus | W. | 59 32 41 | 2855 | 61 5 58 | 2864 | 62 39 3 | 2872 | 64 11 58 | 2880 |
| | Antares | E. | 40 24 36 | 2852 | 38 51 15 | 2861 | 37 18 6 | 2869 | 35 45 7 | 2877 |
| | α Aquilæ | E. | 93 25 10 | 3639 | 92 7 18 | 3647 | 90 49 34 | 3654 | 89 31 58 | 3663 |
| 3 | Pollux | W. | 108 42 10 | 2919 | 110 14 5 | 2926 | 111 45 51 | 2933 | 113 17 28 | 2940 |
| | Venus | W. | 105 35 57 | 3128 | 107 3 32 | 3134 | 108 31 0 | 3141 | 109 58 20 | 3147 |
| | Regulus | W. | 71 54 2 | 2918 | 73 25 58 | 2925 | 74 57 45 | 2932 | 76 29 23 | 2939 |
| | Antares | E. | 28 2 48 | 2916 | 26 30 49 | 2923 | 24 58 59 | 2930 | 23 27 18 | 2936 |
| | α Aquilæ | E. | 83 6 32 | 3717 | 81 50 3 | 3730 | 80 33 48 | 3745 | 79 17 48 | 3759 |
| 4 | Venus | W. | 117 13 13 | 3175 | 118 39 52 | 3181 | 120 6 24 | 3186 | 121 32 50 | 3190 |
| | Regulus | W. | 84 5 32 | 2969 | 85 36 23 | 2976 | 87 7 6 | 2981 | 88 37 42 | 2986 |
| | Spica | W. | 30 3 36 | 2967 | 31 34 30 | 2974 | 33 5 16 | 2979 | 34 35 55 | 2984 |
| | α Aquilæ | E. | 73 1 59 | 3849 | 71 47 47 | 3869 | 70 33 56 | 3892 | 69 20 28 | 3916 |
| | Fomalhaut | E. | 97 45 0 | 3215 | 96 19 9 | 3220 | 94 53 24 | 3225 | 93 27 44 | 3230 |
| | Saturn | E. | 105 37 38 | 2975 | 104 6 54 | 2981 | 102 36 17 | 2986 | 101 5 47 | 2992 |
| 5 | Regulus | W. | 96 9 6 | 3012 | 97 39 4 | 3016 | 99 8 57 | 3020 | 100 38 45 | 3025 |
| | Spica | W. | 42 7 34 | 3010 | 43 37 35 | 3014 | 45 7 31 | 3018 | 46 37 21 | 3022 |
| | α Aquilæ | E. | 63 19 38 | 4059 | 62 8 56 | 4093 | 60 58 48 | 4129 | 59 49 14 | 4168 |
| | Fomalhaut | E. | 86 20 53 | 3256 | 84 55 50 | 3261 | 83 30 53 | 3267 | 82 6 3 | 3274 |
| | Saturn | E. | 93 34 54 | 3016 | 92 5 1 | 3021 | 90 35 14 | 3025 | 89 5 32 | 3030 |
| | α Pegasi | E. | 108 3 25 | 3298 | 106 39 11 | 3297 | 105 14 56 | 3298 | 103 50 42 | 3298 |
| 6 | Regulus | W. | 108 6 27 | 3043 | 109 35 46 | 3047 | 111 5 0 | 3050 | 112 34 11 | 3053 |
| | Spica | W. | 54 5 17 | 3041 | 55 34 39 | 3045 | 57 3 56 | 3048 | 58 33 10 | 3051 |
| | Jupiter | W. | 22 21 48 | 3127 | 23 49 25 | 3116 | 25 17 15 | 3108 | 26 45 15 | 3101 |
| | α Aquilæ | E. | 54 11 27 | 4405 | 53 6 10 | 4464 | 52 1 46 | 4526 | 50 58 17 | 4595 |
| | Fomalhaut | E. | 75 3 47 | 3307 | 73 39 44 | 3314 | 72 15 49 | 3322 | 70 52 3 | 3331 |
| | Saturn | E. | 81 38 18 | 3047 | 80 9 4 | 3051 | 78 39 54 | 3054 | 77 10 48 | 3057 |
| | α Pegasi | E. | 96 49 47 | 3305 | 95 25 41 | 3307 | 94 1 38 | 3309 | 92 37 37 | 3311 |
| 7 | Spica | W. | 65 58 27 | 3063 | 67 27 22 | 3065 | 68 56 14 | 3067 | 70 25 4 | 3069 |
| | Jupiter | W. | 34 6 52 | 3082 | 35 35 24 | 3079 | 37 3 59 | 3078 | 38 32 35 | 3077 |
| | α Aquilæ | E. | 45 56 56 | 5026 | 45 0 21 | 5135 | 44 5 10 | 5254 | 43 11 29 | 5386 |
| | Fomalhaut | E. | 63 55 42 | 3376 | 62 32 58 | 3386 | 61 10 26 | 3398 | 59 48 7 | 3410 |
| | Saturn | E. | 69 46 9 | 3069 | 68 17 22 | 3071 | 66 48 37 | 3073 | 65 19 54 | 3074 |
| | α Pegasi | E. | 85 38 15 | 3325 | 84 14 33 | 3328 | 82 50 54 | 3332 | 81 27 19 | 3336 |
| 8 | Spica | W. | 77 48 50 | 3074 | 79 17 32 | 3074 | 80 46 14 | 3074 | 82 14 55 | 3074 |
| | Jupiter | W. | 45 56 2 | 3070 | 47 24 48 | 3069 | 48 53 35 | 3068 | 50 22 24 | 3066 |
| | Antares | W. | 31 54 26 | 3074 | 33 23 8 | 3074 | 34 51 50 | 3074 | 36 20 31 | 3074 |
| | Fomalhaut | E. | 53 0 11 | 3481 | 51 39 26 | 3498 | 50 19 0 | 3517 | 48 58 55 | 3537 |
| | Saturn | E. | 57 56 42 | 3078 | 56 28 6 | 3079 | 54 59 31 | 3079 | 53 30 56 | 3078 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | α Pegasi | E. | 80° 3′ 49″ | 3339 | 78° 40′ 23″ | 3344 | 77° 17′ 2″ | 3347 | 75° 53′ 45″ | 3351 |
| 9 | Spica | W. | 83 43 37 | 3074 | 85 12 19 | 3073 | 86 41 2 | 3072 | 88 9 46 | 3071 |
| | Jupiter | W. | 51 51 15 | 3065 | 53 20 8 | 3063 | 54 49 3 | 3061 | 56 18 0 | 3059 |
| | Antares | W. | 37 49 13 | 3074 | 39 17 55 | 3073 | 40 46 38 | 3072 | 42 15 22 | 3071 |
| | Fomalhaut | E. | 47 39 12 | 3560 | 46 19 54 | 3584 | 45 1 2 | 3610 | 43 42 38 | 3639 |
| | Saturn | E. | 52 2 20 | 3078 | 50 33 44 | 3078 | 49 5 7 | 3077 | 47 36 29 | 3076 |
| | α Pegasi | E. | 68 58 39 | 3377 | 67 35 56 | 3383 | 66 13 20 | 3389 | 64 50 51 | 3395 |
| | α Arietis | E. | 110 25 1 | 3106 | 108 56 59 | 3105 | 107 28 56 | 3104 | 106 0 51 | 3103 |
| 10 | Spica | W. | 95 33 53 | 3061 | 97 2 50 | 3059 | 98 31 50 | 3056 | 100 0 54 | 3052 |
| | Jupiter | W. | 63 43 27 | 3047 | 65 12 42 | 3043 | 66 42 1 | 3040 | 68 11 24 | 3036 |
| | Antares | W. | 49 39 28 | 3061 | 51 8 25 | 3059 | 52 37 25 | 3056 | 54 6 29 | 3052 |
| | Fomalhaut | E. | 37 19 35 | 3838 | 36 5 12 | 3893 | 34 51 45 | 3955 | 33 39 21 | 4025 |
| | Saturn | E. | 40 12 51 | 3066 | 38 44 0 | 3063 | 37 15 5 | 3060 | 35 46 6 | 3056 |
| | α Pegasi | E. | 58 0 28 | 3436 | 56 38 52 | 3446 | 55 17 28 | 3457 | 53 56 16 | 3470 |
| | α Arietis | E. | 98 39 53 | 3091 | 97 11 32 | 3088 | 95 43 8 | 3085 | 94 14 40 | 3081 |
| | Sun | E. | 141 49 30 | 3470 | 140 28 32 | 3463 | 139 7 27 | 3458 | 137 46 16 | 3453 |
| 11 | Spica | W. | 107 27 26 | 3030 | 108 57 1 | 3025 | 110 26 43 | 3019 | 111 56 32 | 3013 |
| | Jupiter | W. | 75 39 36 | 3014 | 77 9 32 | 3008 | 78 39 35 | 3002 | 80 9 45 | 2996 |
| | Antares | W. | 61 33 1 | 3030 | 63 2 36 | 3025 | 64 32 18 | 3019 | 66 2 7 | 3013 |
| | α Arietis | E. | 86 51 7 | 3060 | 85 22 8 | 3055 | 83 53 3 | 3049 | 82 23 51 | 3043 |
| | Sun | E. | 130 58 45 | 3422 | 129 36 53 | 3415 | 128 14 54 | 3408 | 126 52 47 | 3400 |
| 12 | Jupiter | W. | 87 42 38 | 2961 | 89 13 40 | 2953 | 90 44 52 | 2944 | 92 16 15 | 2936 |
| | Antares | W. | 73 33 12 | 2978 | 75 3 52 | 2970 | 76 34 43 | 2961 | 78 5 45 | 2952 |
| | α Aquilæ | W. | 38 11 7 | 6252 | 38 53 47 | 6019 | 39 38 48 | 5807 | 40 26 4 | 5614 |
| | α Arietis | E. | 74 55 53 | 3009 | 73 25 51 | 3001 | 71 55 40 | 2993 | 70 25 19 | 2985 |
| | Sun | E. | 119 59 55 | 3358 | 118 36 51 | 3349 | 117 13 36 | 3339 | 115 50 10 | 3329 |
| 13 | Jupiter | W. | 99 56 2 | 2887 | 101 28 38 | 2876 | 103 1 28 | 2865 | 104 34 32 | 2853 |
| | Antares | W. | 85 43 52 | 2902 | 87 16 9 | 2891 | 88 48 40 | 2879 | 90 21 26 | 2867 |
| | α Aquilæ | W. | 44 52 23 | 4875 | 45 50 58 | 4760 | 46 51 7 | 4655 | 47 52 45 | 4556 |
| | α Arietis | E. | 62 50 50 | 2939 | 61 19 20 | 2929 | 59 47 38 | 2918 | 58 15 42 | 2908 |
| | Sun | E. | 108 49 53 | 3272 | 107 25 9 | 3260 | 106 0 11 | 3247 | 104 34 57 | 3234 |
| 14 | Jupiter | W. | 112 23 44 | 2791 | 113 58 24 | 2778 | 115 33 21 | 2764 | 117 8 36 | 2750 |
| | Antares | W. | 98 9 15 | 2801 | 99 43 41 | 2788 | 101 18 25 | 2773 | 102 53 28 | 2759 |
| | α Aquilæ | W. | 53 20 54 | 4151 | 54 30 7 | 4084 | 55 40 24 | 4022 | 56 51 42 | 3961 |
| | α Arietis | E. | 50 32 35 | 2852 | 48 59 14 | 2840 | 47 25 38 | 2828 | 45 51 47 | 2816 |
| | Sun | E. | 97 24 47 | 3163 | 95 57 53 | 3148 | 94 30 41 | 3132 | 93 3 10 | 3115 |
| 15 | Antares | W. | 110 53 44 | 2680 | 112 30 51 | 2663 | 114 8 20 | 2646 | 115 46 12 | 2630 |
| | α Aquilæ | W. | 63 2 19 | 3706 | 64 19 0 | 3661 | 65 36 29 | 3619 | 66 54 43 | 3577 |
| | Fomalhaut | W. | 33 55 52 | 3561 | 35 15 9 | 3477 | 36 35 59 | 3400 | 37 58 16 | 3330 |
| | Saturn | W. | 20 59 8 | 2682 | 22 36 12 | 2665 | 24 13 39 | 2648 | 25 51 29 | 2631 |
| | α Arietis | E. | 37 58 43 | 2760 | 36 23 23 | 2750 | 34 47 49 | 2741 | 33 12 3 | 2732 |
| | Sun | E. | 85 40 33 | 3030 | 84 10 58 | 3013 | 82 41 2 | 2995 | 81 10 43 | 2977 |
| 16 | α Aquilæ | W. | 73 36 28 | 3399 | 74 58 46 | 3367 | 76 21 40 | 3337 | 77 45 9 | 3307 |
| | Fomalhaut | W. | 45 8 11 | 3050 | 46 37 22 | 3004 | 48 7 30 | 2962 | 49 38 31 | 2920 |
| | Saturn | W. | 34 6 34 | 2542 | 35 46 49 | 2524 | 37 27 29 | 2506 | 39 8 34 | 2487 |
| | α Pegasi | W. | 26 43 8 | 4197 | 27 51 37 | 4003 | 29 3 14 | 3834 | 30 17 41 | 3686 |
| | Sun | E. | 73 33 19 | 2883 | 72 0 38 | 2864 | 70 27 33 | 2845 | 68 54 3 | 2825 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | α Pegasi | E. | 74° 30′ 33″ | 3356 | 73° 7′ 26″ | 3361 | 71° 44′ 25″ | 3365 | 70° 21′ 29″ | 3371 |
| 9 | Spica | W. | 89 38 31 | 3069 | 91 7 18 | 3068 | 92 36 7 | 3065 | 94 4 59 | 3064 |
| | Jupiter | W. | 57 47 0 | 3057 | 59 16 2 | 3055 | 60 45 7 | 3052 | 62 14 15 | 3049 |
| | Antares | W. | 43 44 7 | 3069 | 45 12 54 | 3068 | 46 41 43 | 3066 | 48 10 34 | 3064 |
| | Fomalhaut | E. | 42 24 46 | 3671 | 41 7 28 | 3707 | 39 50 48 | 3746 | 38 34 49 | 3789 |
| | Saturn | E. | 46 7 50 | 3074 | 44 39 9 | 3073 | 43 10 26 | 3070 | 41 41 40 | 3068 |
| | α Pegasi | E. | 63 28 29 | 3402 | 62 6 15 | 3410 | 60 44 10 | 3418 | 59 22 14 | 3427 |
| | α Arietis | E. | 104 32 45 | 3101 | 103 4 36 | 3099 | 101 36 25 | 3096 | 100 8 11 | 3093 |
| 10 | Spica | W. | 101 30 3 | 3048 | 102 59 16 | 3044 | 104 28 34 | 3040 | 105 57 57 | 3035 |
| | Jupiter | W. | 69 40 52 | 3032 | 71 10 25 | 3028 | 72 40 3 | 3023 | 74 9 47 | 3019 |
| | Antares | W. | 55 35 38 | 3048 | 57 4 51 | 3044 | 58 34 9 | 3040 | 60 3 32 | 3035 |
| | Fomalhaut | E. | 32 28 6 | 4105 | 31 18 9 | 4196 | 30 9 39 | 4301 | 29 2 47 | 4422 |
| | Saturn | E. | 34 17 3 | 3052 | 32 47 55 | 3048 | 31 18 42 | 3044 | 29 49 24 | 3039 |
| | α Pegasi | E. | 52 35 18 | 3482 | 51 14 34 | 3497 | 49 54 7 | 3513 | 48 33 57 | 3530 |
| | α Arietis | E. | 92 46 7 | 3078 | 91 17 30 | 3073 | 89 48 48 | 3069 | 88 20 0 | 3065 |
| | Sun | E. | 136 24 59 | 3447 | 135 3 36 | 3441 | 133 42 6 | 3435 | 132 20 29 | 3429 |
| 11 | Spica | W. | 113 26 28 | 3007 | 114 56 32 | 3000 | 116 26 45 | 2993 | 117 57 6 | 2985 |
| | Jupiter | W. | 81 40 3 | 2989 | 83 10 29 | 2983 | 84 41 3 | 2976 | 86 11 46 | 2969 |
| | Antares | W. | 67 32 3 | 3007 | 69 2 7 | 3000 | 70 32 20 | 2993 | 72 2 41 | 2985 |
| | α Arietis | E. | 80 54 31 | 3037 | 79 25 4 | 3030 | 77 55 29 | 3023 | 76 25 45 | 3017 |
| | Sun | E. | 125 30 31 | 3393 | 124 8 6 | 3385 | 122 45 32 | 3376 | 121 22 48 | 3368 |
| 12 | Jupiter | W. | 93 47 48 | 2927 | 95 19 33 | 2917 | 96 51 30 | 2908 | 98 23 39 | 2897 |
| | Antares | W. | 79 36 58 | 2943 | 81 8 22 | 2933 | 82 39 59 | 2923 | 84 11 49 | 2913 |
| | α Aquilæ | W. | 41 15 29 | 5440 | 42 6 55 | 5281 | 43 0 16 | 5135 | 43 55 27 | 4999 |
| | α Arietis | E. | 68 54 48 | 2977 | 67 24 6 | 2967 | 65 53 12 | 2958 | 64 22 7 | 2949 |
| | Sun | E. | 114 26 32 | 3319 | 113 2 42 | 3307 | 111 38 39 | 3296 | 110 14 23 | 3284 |
| 13 | Jupiter | W. | 106 7 51 | 2842 | 107 41 25 | 2829 | 109 15 15 | 2817 | 110 49 21 | 2804 |
| | Antares | W. | 91 54 27 | 2855 | 93 27 44 | 2842 | 95 1 17 | 2829 | 96 35 7 | 2815 |
| | α Aquilæ | W. | 48 55 48 | 4464 | 50 0 12 | 4377 | 51 5 54 | 4297 | 52 12 49 | 4222 |
| | α Arietis | E. | 56 43 33 | 2897 | 55 11 10 | 9886 | 53 38 33 | 2874 | 52 5 41 | 2863 |
| | Sun | E. | 103 9 28 | 3220 | 101 43 43 | 3206 | 100 17 41 | 3193 | 98 51 23 | 3178 |
| 14 | Jupiter | W. | 118 44 9 | 2736 | 120 20 1 | 2722 | 121 56 12 | 2707 | 123 32 43 | 2692 |
| | Antares | W. | 104 28 50 | 2744 | 106 4 32 | 2728 | 107 40 35 | 2712 | 109 16 59 | 2696 |
| | α Aquilæ | W. | 58 4 0 | 3905 | 59 17 15 | 3852 | 60 31 24 | 3800 | 61 46 26 | 3751 |
| | α Arietis | E. | 44 17 40 | 2805 | 42 43 18 | 2793 | 41 8 41 | 2782 | 39 33 49 | 2771 |
| | Sun | E. | 91 35 19 | 3100 | 90 7 9 | 3083 | 88 38 38 | 3065 | 87 9 46 | 3048 |
| 15 | Antares | W. | 117 24 26 | 2613 | 119 3 4 | 2595 | 120 42 6 | 2577 | 122 21 32 | 2560 |
| | α Aquilæ | W. | 68 13 42 | 3539 | 69 33 23 | 3502 | 70 53 45 | 3466 | 72 14 47 | 3431 |
| | Fomalhaut | W. | 39 21 53 | 3265 | 40 46 46 | 3205 | 42 12 49 | 3149 | 43 39 59 | 3098 |
| | Saturn | W. | 27 29 42 | 2614 | 29 8 18 | 2596 | 30 47 19 | 2578 | 32 26 44 | 2560 |
| | α Arietis | E. | 31 36 5 | 2725 | 29 59 58 | 2719 | 28 23 44 | 2716 | 26 47 25 | 2714 |
| | Sun | E. | 79 40 1 | 2958 | 78 8 56 | 2940 | 76 37 28 | 2921 | 75 5 36 | 2901 |
| 16 | α Aquilæ | W. | 79 9 12 | 3280 | 80 33 47 | 3253 | 81 58 53 | 3228 | 83 24 29 | 3204 |
| | Fomalhaut | W. | 51 10 24 | 2882 | 52 43 6 | 2845 | 54 16 35 | 2810 | 55 50 50 | 2777 |
| | Saturn | W. | 40 50 5 | 2469 | 42 32 2 | 2450 | 44 14 25 | 2432 | 45 57 14 | 2413 |
| | α Pegasi | W. | 31 34 43 | 3555 | 32 54 6 | 3441 | 34 15 36 | 3338 | 35 39 3 | 3247 |
| | Sun | E. | 67 20 7 | 2805 | 65 45 46 | 2786 | 64 11 0 | 2767 | 62 35 49 | 2747 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | α Aquilæ | W. | 84° 50′ 33″ | 3181 | 86° 17′ 5″ | 3160 | 87° 44′ 2″ | 3139 | 89° 11′ 24″ | 3120 |
| | Fomalhaut | W. | 57 25 48 | 2744 | 59 1 29 | 2713 | 60 37 51 | 2684 | 62 14 52 | 2655 |
| | Saturn | W. | 47 40 30 | 2395 | 49 24 12 | 2376 | 51 8 21 | 2357 | 52 52 57 | 2339 |
| | α Pegasi | W. | 37 4 16 | 3164 | 38 31 8 | 3089 | 39 59 31 | 3021 | 41 29 18 | 2958 |
| | Sun | E. | 61 0 12 | 2729 | 59 24 10 | 2709 | 57 47 42 | 2690 | 56 10 49 | 2672 |
| 18 | α Aquilæ | W. | 96 33 27 | 3047 | 98 2 42 | 3036 | 99 32 10 | 3028 | 101 1 48 | 3021 |
| | Fomalhaut | W. | 70 29 13 | 2527 | 72 9 48 | 2505 | 73 50 54 | 2484 | 75 32 30 | 2462 |
| | Saturn | W. | 61 42 32 | 2250 | 63 29 45 | 2233 | 65 17 24 | 2216 | 67 5 28 | 2199 |
| | α Pegasi | W. | 49 16 12 | 2709 | 50 52 40 | 2669 | 52 30 1 | 2632 | 54 8 13 | 2596 |
| | Sun | E. | 48 0 13 | 2583 | 46 20 54 | 2566 | 44 41 12 | 2550 | 43 1 8 | 2534 |
| 19 | Fomalhaut | W. | 84 7 27 | 2373 | 85 51 41 | 2358 | 87 36 16 | 2344 | 89 21 12 | 2331 |
| | Saturn | W. | 76 11 51 | 2122 | 78 2 16 | 2108 | 79 53 3 | 2095 | 81 44 10 | 2081 |
| | α Pegasi | W. | 62 30 21 | 2450 | 64 12 44 | 2426 | 65 55 41 | 2404 | 67 39 10 | 2382 |
| | Sun | E. | 34 35 45 | 2469 | 32 53 48 | 2459 | 31 11 37 | 2451 | 29 29 15 | 2444 |
| 23 | Sun | W. | 22 52 16 | 2403 | 24 35 46 | 2400 | 26 19 21 | 2400 | 28 2 56 | 2402 |
| | Spica | E. | 87 30 41 | 2015 | 85 37 30 | 2025 | 83 44 34 | 2034 | 81 51 53 | 2044 |
| | Jupiter | E. | 118 10 35 | 2018 | 116 17 28 | 2026 | 114 24 34 | 2035 | 112 31 54 | 2044 |
| 24 | Sun | W. | 36 39 11 | 2439 | 38 21 50 | 2450 | 40 4 13 | 2462 | 41 46 19 | 2476 |
| | Spica | E. | 72 32 43 | 2104 | 70 41 50 | 2118 | 68 51 18 | 2132 | 67 1 7 | 2147 |
| | Jupiter | E. | 103 12 39 | 2103 | 101 21 44 | 2116 | 99 31 9 | 2130 | 97 40 55 | 2144 |
| | Antares | E. | 118 27 10 | 2104 | 116 36 17 | 2118 | 114 45 45 | 2132 | 112 55 34 | 2147 |
| 25 | Sun | W. | 50 11 54 | 2551 | 51 51 57 | 2567 | 53 31 37 | 2584 | 55 10 54 | 2601 |
| | Spica | E. | 57 55 55 | 2225 | 56 8 4 | 2241 | 54 20 37 | 2258 | 52 33 35 | 2275 |
| | Jupiter | E. | 88 35 25 | 2222 | 86 47 30 | 2239 | 85 0 0 | 2256 | 83 12 55 | 2273 |
| | Antares | E. | 103 50 22 | 2225 | 102 2 31 | 2241 | 100 15 4 | 2258 | 98 28 2 | 2275 |
| 26 | Sun | W. | 63 21 19 | 2692 | 64 58 10 | 2710 | 66 34 37 | 2729 | 68 10 39 | 2747 |
| | Spica | E. | 43 44 47 | 2362 | 42 0 18 | 2380 | 40 16 15 | 2398 | 38 32 37 | 2416 |
| | Jupiter | E. | 74 23 56 | 2362 | 72 39 26 | 2380 | 70 55 22 | 2398 | 69 11 45 | 2417 |
| | Antares | E. | 89 39 13 | 2362 | 87 54 44 | 2380 | 86 10 40 | 2398 | 84 27 2 | 2416 |
| 27 | Sun | W. | 76 4 39 | 2841 | 77 38 14 | 2859 | 79 11 25 | 2877 | 80 44 13 | 2896 |
| | Jupiter | E. | 60 40 9 | 2509 | 58 59 8 | 2527 | 57 18 32 | 2545 | 55 38 21 | 2564 |
| | Antares | E. | 75 55 12 | 2504 | 74 14 4 | 2522 | 72 33 21 | 2539 | 70 53 2 | 2556 |
| 28 | Sun | W. | 88 22 25 | 2985 | 89 52 57 | 3002 | 91 23 7 | 3019 | 92 52 56 | 3036 |
| | Regulus | W. | 37 20 47 | 2643 | 38 58 43 | 2660 | 40 36 17 | 2675 | 42 13 30 | 2690 |
| | Jupiter | E. | 47 23 43 | 2654 | 45 46 1 | 2672 | 44 8 43 | 2690 | 42 31 50 | 2708 |
| | Antares | E. | 62 37 16 | 2639 | 60 59 14 | 2655 | 59 21 34 | 2671 | 57 44 15 | 2686 |
| | α Aquilæ | E. | 111 51 13 | 3564 | 110 31 59 | 3560 | 109 12 41 | 3558 | 107 53 21 | 3557 |
| 29 | Sun | W. | 100 17 0 | 3115 | 101 44 51 | 3129 | 103 12 25 | 3144 | 104 39 41 | 3159 |
| | Regulus | W. | 50 14 40 | 2763 | 51 49 57 | 2775 | 53 24 57 | 2789 | 54 59 39 | 2801 |
| | Antares | E. | 49 42 40 | 2759 | 48 7 18 | 2773 | 46 32 15 | 2786 | 44 57 29 | 2800 |
| | α Aquilæ | E. | 101 16 55 | 3571 | 99 57 49 | 3577 | 98 38 50 | 3584 | 97 19 58 | 3591 |
| 30 | Sun | W. | 111 51 48 | 3225 | 113 17 27 | 3238 | 114 42 51 | 3250 | 116 8 1 | 3262 |
| | Regulus | W. | 62 49 6 | 2863 | 64 22 13 | 2873 | 65 55 6 | 2883 | 67 27 46 | 2894 |
| | Antares | E. | 37 7 48 | 2860 | 35 34 38 | 2871 | 34 1 42 | 2882 | 32 29 0 | 2893 |
| | α Aquilæ | E. | 90 47 53 | 3638 | 89 30 0 | 3650 | 88 12 20 | 3663 | 86 54 53 | 3675 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | α Aquilæ | W. | 90° 39′ 9″ | 3102 | 92° 7′ 16″ | 3087 | 93° 35′ 42″ | 3072 | 95° 4′ 26″ | 3058 |
| | Fomalhaut | W. | 63 52 32 | 2628 | 65 30 49 | 2601 | 67 9 43 | 2576 | 68 49 11 | 2551 |
| | Saturn | W. | 54 37 59 | 2321 | 56 23 28 | 2303 | 58 9 23 | 2285 | 59 55 44 | 2267 |
| | α Pegasi | W. | 43 0 24 | 2900 | 44 32 43 | 2847 | 46 6 10 | 2798 | 47 40 41 | 2752 |
| | Sun | E. | 54 33 31 | 2653 | 52 55 48 | 2635 | 51 17 41 | 2617 | 49 39 9 | 2599 |
| 18 | α Aquilæ | W. | 102 31 35 | 3017 | 104 1 27 | 3014 | 105 31 22 | 3014 | 107 1 17 | 3016 |
| | Fomalhaut | W. | 77 14 36 | 2443 | 78 57 10 | 2424 | 80 40 10 | 2406 | 82 23 36 | 2389 |
| | Saturn | W. | 68 53 57 | 2183 | 70 42 50 | 2167 | 72 32 7 | 2151 | 74 21 48 | 2137 |
| | α Pegasi | W. | 55 47 13 | 2564 | 57 26 58 | 2533 | 59 7 26 | 2504 | 60 48 34 | 2476 |
| | Sun | E. | 41 20 42 | 2520 | 39 39 56 | 2506 | 37 58 51 | 2492 | 36 17 27 | 2480 |
| 19 | Fomalhaut | W. | 91 6 27 | 2319 | 92 51 59 | 2307 | 94 37 48 | 2298 | 96 23 51 | 2289 |
| | Saturn | W. | 83 35 38 | 2069 | 85 27 25 | 2057 | 87 19 30 | 2046 | 89 11 52 | 2035 |
| | α Pegasi | W. | 69 23 10 | 2363 | 71 7 38 | 2345 | 72 52 32 | 2328 | 74 37 51 | 2313 |
| | Sun | E. | 27 46 43 | 2440 | 26 4 5 | 2438 | 24 21 24 | 2440 | 22 38 46 | 2445 |
| 23 | Sun | W. | 29 46 28 | 2406 | 31 29 54 | 2412 | 33 13 11 | 2420 | 34 56 17 | 2429 |
| | Spica | E. | 79 59 28 | 2055 | 78 7 19 | 2066 | 76 15 28 | 2079 | 74 23 56 | 2091 |
| | Jupiter | E. | 110 39 29 | 2055 | 108 47 20 | 2066 | 106 55 28 | 2077 | 105 3 54 | 2090 |
| 24 | Sun | W. | 43 28 6 | 2489 | 45 9 34 | 2504 | 46 50 42 | 2519 | 48 31 29 | 2535 |
| | Spica | E. | 65 11 19 | 2161 | 63 21 53 | 2177 | 61 32 50 | 2192 | 59 44 11 | 2208 |
| | Jupiter | E. | 95 51 3 | 2159 | 94 1 33 | 2175 | 92 12 27 | 2190 | 90 23 44 | 2206 |
| | Antares | E. | 111 5 46 | 2161 | 109 16 20 | 2177 | 107 27 17 | 2192 | 105 38 38 | 2208 |
| 25 | Sun | W. | 56 49 47 | 2618 | 58 28 17 | 2637 | 60 6 22 | 2655 | 61 44 3 | 2673 |
| | Spica | E. | 50 46 59 | 2292 | 49 0 48 | 2309 | 47 15 2 | 2327 | 45 29 42 | 2344 |
| | Jupiter | F. | 81 26 16 | 2290 | 79 40 2 | 2308 | 77 54 14 | 2326 | 76 8 52 | 2344 |
| | Antares | E. | 96 41 26 | 2292 | 94 55 14 | 2309 | 93 9 28 | 2327 | 91 24 8 | 2344 |
| 26 | Sun | W. | 69 46 16 | 2766 | 71 21 28 | 2785 | 72 56 16 | 2803 | 74 30 40 | 2822 |
| | Spica | E. | 36 49 25 | 2434 | 35 6 38 | 2452 | 33 24 17 | 2470 | 31 42 21 | 2487 |
| | Jupiter | E. | 67 28 34 | 2435 | 65 45 49 | 2453 | 64 3 30 | 2472 | 62 21 37 | 2490 |
| | Antares | E. | 82 43 50 | 2434 | 81 1 3 | 2451 | 79 18 41 | 2469 | 77 36 44 | 2487 |
| 27 | Sun | W. | 82 16 37 | 2914 | 83 48 38 | 2932 | 85 20 16 | 2950 | 86 51 32 | 2968 |
| | Jupiter | E. | 53 58 36 | 2582 | 52 19 16 | 2599 | 50 40 20 | 2618 | 49 1 49 | 2636 |
| | Antares | E. | 69 13 7 | 2573 | 67 33 35 | 2590 | 65 54 26 | 2607 | 64 15 40 | 2623 |
| 28 | Sun | W. | 94 22 24 | 3052 | 95 51 32 | 3068 | 97 20 21 | 3084 | 98 48 50 | 3100 |
| | Regulus | W. | 43 50 23 | 2705 | 45 26 56 | 2719 | 47 3 10 | 2734 | 48 39 5 | 2749 |
| | Jupiter | E. | 40 55 21 | 2726 | 39 19 16 | 2744 | 37 43 35 | 2763 | 36 8 18 | 2781 |
| | Antares | E. | 56 7 16 | 2701 | 54 30 38 | 2716 | 52 54 19 | 2731 | 51 18 20 | 2745 |
| | α Aquilæ | E. | 106 34 0 | 3558 | 105 14 40 | 3559 | 103 55 21 | 3563 | 102 36 6 | 3566 |
| 29 | Sun | W. | 106 6 39 | 3173 | 107 33 20 | 3187 | 108 59 45 | 3200 | 110 25 54 | 3213 |
| | Regulus | W. | 56 34 5 | 2815 | 58 8 14 | 2827 | 59 42 7 | 2839 | 61 15 44 | 2851 |
| | Antares | E. | 43 23 1 | 2812 | 41 48 49 | 2825 | 40 14 53 | 2837 | 38 41 13 | 2849 |
| | α Aquilæ | E. | 96 1 14 | 3599 | 94 42 39 | 3608 | 93 24 13 | 3618 | 92 5 58 | 3627 |
| 30 | Sun | W. | 117 32 57 | 3273 | 118 57 40 | 3284 | 120 22 10 | 3295 | 121 46 27 | 3305 |
| | Regulus | W. | 69 0 12 | 2905 | 70 32 25 | 2914 | 72 4 26 | 2924 | 73 36 15 | 2932 |
| | Antares | E. | 30 56 32 | 2902 | 29 24 16 | 2912 | 27 52 13 | 2922 | 26 20 22 | 2931 |
| | α Aquilæ | E. | 85 37 39 | 3688 | 84 20 39 | 3702 | 83 3 54 | 3716 | 81 47 24 | 3732 |

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S |  |  |  |  | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be added to Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
|  |  | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | Semi-diameter. |  |  |  |
|  |  | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Sat. | 1 | 6 43 9.09 | 10.331 | N.23 5 12.6 | −10.65 | 15 46.12 | 68.76 | 3 37.21 | 0.475 |
| *Sun.* | 2 | 6 47 16.94 | 10.320 | 23 0 44.8 | 11.66 | 15 46.13 | 68.73 | 3 48.46 | 0.463 |
| Mon. | 3 | 6 51 24.49 | 10.307 | 22 55 53.0 | 12.66 | 15 46.14 | 68.69 | 3 59.42 | 0.450 |
| Tues. | 4 | 6 55 31.72 | 10.293 | 22 50 37.0 | 13.65 | 15 46.15 | 68.64 | 4 10.07 | 0.436 |
| Wed. | 5 | 6 59 38.62 | 10.280 | 22 44 57.4 | 14.64 | 15 46.16 | 68.59 | 4 20.38 | 0.421 |
| Thur. | 6 | 7 3 45.16 | 10.265 | 22 38 54.1 | 15.62 | 15 46.18 | 68.54 | 4 30.33 | 0.406 |
| Frid. | 7 | 7 7 51.33 | 10.250 | 22 32 27.3 | 16.60 | 15 46.20 | 68.49 | 4 39.91 | 0.391 |
| Sat. | 8 | 7 11 57.12 | 10.234 | 22 25 37.2 | 17.57 | 15 46.22 | 68.44 | 4 49.12 | 0.375 |
| *Sun.* | 9 | 7 16 2.52 | 10.217 | 22 18 24.0 | 18.53 | 15 46.25 | 68.38 | 4 57.94 | 0.359 |
| Mon. | 10 | 7 20 7.52 | 10.200 | 22 10 47.8 | 19.49 | 15 46.28 | 68.32 | 5 6.36 | 0.341 |
| Tues. | 11 | 7 24 12.10 | 10.182 | 22 2 48.5 | 20.44 | 15 46.31 | 68.26 | 5 14.36 | 0.323 |
| Wed. | 12 | 7 28 16.24 | 10.163 | 21 54 26.4 | 21.38 | 15 46.35 | 68.20 | 5 21.92 | 0.305 |
| Thur. | 13 | 7 32 19.93 | 10.144 | 21 45 41.7 | 22.32 | 15 46.39 | 68.13 | 5 29.03 | 0.287 |
| Frid. | 14 | 7 36 23.15 | 10.124 | 21 36 35.0 | 23.25 | 15 46.43 | 68.06 | 5 35.68 | 0.267 |
| Sat. | 15 | 7 40 25.90 | 10.104 | 21 27 5.9 | 24.17 | 15 46.48 | 67.99 | 5 41.86 | 0.247 |
| *Sun.* | 16 | 7 44 28.16 | 10.083 | 21 17 14.7 | 25.08 | 15 46.54 | 67.92 | 5 47.55 | 0.226 |
| Mon. | 17 | 7 48 29.93 | 10.061 | 21 7 1.9 | 25.98 | 15 46.60 | 67.84 | 5 52.73 | 0.205 |
| Tues. | 18 | 7 52 31.17 | 10.039 | 20 56 27.6 | 26.87 | 15 46.66 | 67.77 | 5 57.39 | 0.184 |
| Wed. | 19 | 7 56 31.87 | 10.017 | 20 45 31.9 | 27.75 | 15 46.73 | 67.69 | 6 1.53 | 0.163 |
| Thur. | 20 | 8 0 32.04 | 9.994 | 20 34 15.2 | 28.63 | 15 46.81 | 67.61 | 6 5.14 | 0.139 |
| Frid. | 21 | 8 4 31.65 | 9.971 | 20 22 37.7 | 29.49 | 15 46.89 | 67.53 | 6 8.19 | 0.116 |
| Sat. | 22 | 8 8 30.69 | 9.947 | 20 10 39.6 | 30.34 | 15 46.98 | 67.45 | 6 10.66 | 0.092 |
| *Sun.* | 23 | 8 12 29.15 | 9.923 | 19 58 21.3 | 31.18 | 15 47.07 | 67.36 | 6 12.56 | 0.068 |
| Mon. | 24 | 8 16 27.03 | 9.899 | 19 45 43.0 | 32.00 | 15 47.17 | 67.28 | 6 13.88 | 0.043 |
| Tues. | 25 | 8 20 24.30 | 9.874 | 19 32 45.0 | 32.82 | 15 47.27 | 67.19 | 6 14.60 | +0.017 |
| Wed. | 26 | 8 24 20.96 | 9.849 | 19 19 27.5 | 33.63 | 15 47.38 | 67.11 | 6 14.69 | −0.008 |
| Thur. | 27 | 8 28 17.00 | 9.823 | 19 5 50.9 | 34.42 | 15 47.49 | 67.02 | 6 14.17 | 0.034 |
| Frid. | 28 | 8 32 12.42 | 9.797 | 18 51 55.5 | 35.20 | 15 47.61 | 66.94 | 6 13.04 | 0.060 |
| Sat. | 29 | 8 36 7.22 | 9.771 | 18 37 41.6 | 35.96 | 15 47.73 | 66.85 | 6 11.28 | 0.086 |
| *Sun.* | 30 | 8 40 1.39 | 9.745 | 18 23 9.4 | 36.72 | 15 47.85 | 66.77 | 6 8.90 | 0.112 |
| Mon. | 31 | 8 43 54.95 | 9.719 | 18 8 19.1 | 37.46 | 15 47.98 | 66.68 | 6 5.91 | 0.138 |
| Tues. | 32 | 8 47 47.89 | 9.693 | N.17 53 11.1 | −38.19 | 15 48.11 | 66.60 | 6 2.31 | 0.164 |

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting $0^{s}.19$ from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing.

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, *to be subtracted from Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | | | |
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Sat. | 1 | 6 43 8.48 | 10.331 | N.23 5 13.2 | -10.66 | 3 37.18 | 0.475 | 6 39 31.30 |
| *Sun.* | 2 | 6 47 16.29 | 10.319 | 23 0 45.5 | 11.66 | 3 48.43 | 0.463 | 6 43 27.86 |
| Mon. | 3 | 6 51 23.81 | 10.306 | 22 55 53.8 | 12.66 | 3 59.39 | 0.450 | 6 47 24.42 |
| Tues. | 4 | 6 55 31.01 | 10.292 | 22 50 38.0 | 13.65 | 4 10.04 | 0.436 | 6 51 20.97 |
| Wed. | 5 | 6 59 37.88 | 10.279 | 22 44 58.5 | 14.64 | 4 20.35 | 0.421 | 6 55 17.53 |
| Thur. | 6 | 7 3 44.39 | 10.264 | 22 38 55.3 | 15.62 | 4 30.30 | 0.406 | 6 59 14.09 |
| Frid. | 7 | 7 7 50.53 | 10.249 | 22 32 28.6 | 16.60 | 4 39.88 | 0.391 | 7 3 10.65 |
| Sat. | 8 | 7 11 56.30 | 10.233 | 22 25 38.6 | 17.57 | 4 49.09 | 0.375 | 7 7 7.21 |
| *Sun.* | 9 | 7 16 1.68 | 10.216 | 22 18 25.5 | 18.53 | 4 57.91 | 0.359 | 7 11 3.77 |
| Mon. | 10 | 7 20 6.66 | 10.199 | 22 10 49.4 | 19.49 | 5 6.34 | 0.341 | 7 15 0.32 |
| Tues. | 11 | 7 24 11.21 | 10.181 | 22 2 50.3 | 20.44 | 5 14.33 | 0.323 | 7 18 56.88 |
| Wed. | 12 | 7 28 15.33 | 10.162 | 21 54 28.3 | 21.38 | 5 21.89 | 0.305 | 7 22 53.44 |
| Thur. | 13 | 7 32 19.00 | 10.143 | 21 45 43.7 | 22.32 | 5 29.00 | 0.287 | 7 26 50.00 |
| Frid. | 14 | 7 36 22.21 | 10.123 | 21 36 37.1 | 23.25 | 5 35.65 | 0.267 | 7 30 46.56 |
| Sat. | 15 | 7 40 24.94 | 10.103 | 21 27 8.2 | 24.17 | 5 41.82 | 0.247 | 7 34 43.12 |
| *Sun.* | 16 | 7 44 27.19 | 10.082 | 21 17 17.2 | 25.08 | 5 47.52 | 0.226 | 7 38 39.67 |
| Mon. | 17 | 7 48 28.94 | 10.061 | 21 7 4.5 | 25.98 | 5 52.71 | 0.205 | 7 42 36.23 |
| Tues. | 18 | 7 52 30.17 | 10.039 | 20 56 30.2 | 26.87 | 5 57.38 | 0.184 | 7 46 32.79 |
| Wed. | 19 | 7 56 30.87 | 10.017 | 20 45 34.6 | 27.75 | 6 1.52 | 0.163 | 7 50 29.35 |
| Thur. | 20 | 8 0 31.04 | 9.994 | 20 34 18.1 | 28.63 | 6 5.14 | 0.139 | 7 54 25.90 |
| Frid. | 21 | 8 4 30.64 | 9.971 | 20 22 40.7 | 29.49 | 6 8.18 | 0.116 | 7 58 22.46 |
| Sat. | 22 | 8 8 29.67 | 9.947 | 20 10 42.7 | 30.34 | 6 10.65 | 0.092 | 8 2 19.02 |
| *Sun.* | 23 | 8 12 28.12 | 9.923 | 19 58 24.5 | 31.18 | 6 12.54 | 0.068 | 8 6 15.58 |
| Mon. | 24 | 8 16 26.00 | 9.899 | 19 45 46.3 | 32.00 | 6 13.87 | 0.043 | 8 10 12.13 |
| Tues. | 25 | 8 20 23.28 | 9.874 | 19 32 48.4 | 32.82 | 6 14.59 | +0.017 | 8 14 8.69 |
| Wed. | 26 | 8 24 19.94 | 9.849 | 19 19 31.0 | 33.63 | 6 14.69 | -0.008 | 8 18 5.25 |
| Thur. | 27 | 8 28 15.98 | 9.823 | 19 5 54.5 | 34.42 | 6 14.17 | 0.034 | 8 22 1.81 |
| Frid. | 28 | 8 32 11.41 | 9.797 | 18 51 59.1 | 35.20 | 6 13.05 | 0.060 | 8 25 58.36 |
| Sat. | 29 | 8 36 6.21 | 9.771 | 18 37 45.3 | 35.96 | 6 11.29 | 0.086 | 8 29 54.92 |
| *Sun.* | 30 | 8 40 0.39 | 9.745 | 18 23 13.0 | 36.72 | 6 8.91 | 0.112 | 8 33 51.48 |
| Mon. | 31 | 8 43 53.96 | 9.719 | 18 8 22.9 | 37.46 | 6 5.92 | 0.138 | 8 37 48.04 |
| Tues. | 32 | 8 47 46.92 | 9.693 | N.17 53 15.0 | 38.19 | 6 2.33 | 0.164 | 8 41 44.59 |

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing.

Diff. for 1 hour.
$+9^{s}.8565$

AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | *True* LONGITUDE. | | Diff. for 1 hour. | LATITUDE. | | | |
| | | λ | λ′ | | | | | |
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 183 | 99 55 5.0 | 54 37.6 | 142.96 | −0.30 | 0.0072250 | − 0.2 | 17 17 38.25 |
| 2 | 184 | 100 52 15.9 | 51 48.3 | 142.95 | 0.39 | .0072237 | 0.9 | 17 13 42.32 |
| 3 | 185 | 101 49 26.6 | 48 58.8 | 142.95 | 0.45 | .0072207 | 1.6 | 17 9 46.41 |
| 4 | 186 | 102 46 37.2 | 46 9.3 | 142.95 | 0.49 | .0072161 | 2.2 | 17 5 50.50 |
| 5 | 187 | 103 43 47.8 | 43 19.6 | 142.95 | 0.50 | .0072100 | 2.8 | 17 1 54.58 |
| 6 | 188 | 104 40 58.4 | 40 30.0 | 142.95 | 0.46 | .0072026 | 3.4 | 16 57 58.67 |
| 7 | 189 | 105 38 9.0 | 37 40.4 | 142.96 | 0.40 | .0071936 | 4.1 | 16 54 2.76 |
| 8 | 190 | 106 35 19.8 | 34 51.0 | 142.97 | 0.31 | .0071831 | 4.7 | 16 50 6.85 |
| 9 | 191 | 107 32 31.0 | 32 2.1 | 142.98 | 0.22 | .0071710 | 5.3 | 16 46 10.94 |
| 10 | 192 | 108 29 42.6 | 29 13.5 | 142.99 | −0.10 | .0071576 | 6.0 | 16 42 15.02 |
| 11 | 193 | 109 26 54.6 | 26 25.3 | 143.01 | +0.02 | .0071425 | 6.7 | 16 38 19.10 |
| 12 | 194 | 110 24 7.2 | 23 37.7 | 143.03 | 0.15 | .0071255 | 7.5 | 16 34 23.19 |
| 13 | 195 | 111 21 20.3 | 20 50.6 | 143.06 | 0.28 | .0071067 | 8.3 | 16 30 27.28 |
| 14 | 196 | 112 18 34.1 | 18 4.3 | 143.09 | 0.39 | .0070861 | 9.1 | 16 26 31.37 |
| 15 | 197 | 113 15 48.6 | 15 18.0 | 143.12 | 0.49 | .0070635 | 10.0 | 16 22 35.46 |
| 16 | 198 | 114 13 3.7 | 12 33.5 | 143.14 | 0.56 | .0070386 | 10.9 | 16 18 39.55 |
| 17 | 199 | 115 10 19.5 | 9 49.1 | 143.17 | 0.61 | .0070114 | 11.8 | 16 14 43.64 |
| 18 | 200 | 116 7 36.0 | 7 5.4 | 143.20 | 0.61 | .0069818 | 12.8 | 16 10 47.72 |
| 19 | 201 | 117 4 53.1 | 4 22.4 | 143.23 | 0.60 | .0069497 | 13.9 | 16 6 51.81 |
| 20 | 202 | 118 2 10.9 | 1 40.0 | 143.26 | 0.54 | .0069149 | 15.0 | 16 2 55.90 |
| 21 | 203 | 118 59 29.4 | 58 58.3 | 143.28 | 0.48 | .0068777 | 16.1 | 15 58 59.99 |
| 22 | 204 | 119 56 48.5 | 56 17.2 | 143.31 | 0.38 | .0068379 | 17.2 | 15 55 4.07 |
| 23 | 205 | 120 54 8.1 | 53 36.6 | 143.33 | 0.26 | .0067956 | 18.2 | 15 51 8.16 |
| 24 | 206 | 121 51 28.2 | 50 56.6 | 143.36 | +0.13 | .0067508 | 19.2 | 15 47 12.25 |
| 25 | 207 | 122 48 48.9 | 48 17.1 | 143.38 | 0.00 | .0067035 | 20.1 | 15 43 16.35 |
| 26 | 208 | 123 46 10.2 | 45 38.2 | 143.40 | −0.14 | .0066539 | 21.0 | 15 39 20.43 |
| 27 | 209 | 124 43 32.0 | 42 59.8 | 143.42 | 0.27 | .0066022 | 21.9 | 15 35 24.52 |
| 28 | 210 | 125 40 54.4 | 40 22.1 | 143.44 | 0.37 | .0065485 | 22.7 | 15 31 28.61 |
| 29 | 211 | 126 38 17.3 | 37 44.9 | 143.46 | 0.47 | .0064928 | 23.5 | 15 27 32.70 |
| 30 | 212 | 127 35 40.7 | 35 8.1 | 143.48 | 0.53 | .0064354 | 24.3 | 15 23 36.79 |
| 31 | 213 | 128 33 4.7 | 32 31.9 | 143.51 | 0.57 | .0063760 | 25.0 | 15 19 40.88 |
| 32 | 214 | 129 30 29.3 | 29 56.3 | 143.54 | −0.56 | 0.0063153 | −25.6 | 15 15 44.97 |

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
—$9^s.8296$

## GREENWICH MEAN TIME.

### THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | MERIDIAN PASSAGE. | | AGE. |
|---|---|---|---|---|---|---|---|---|---|
| | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. | | Diff. for 1 hour. | Noon. |
| | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 15 1.0 | 14 57.2 | 55 0.0 | −1.24 | 54 46.1 | −1.08 | 8 13.7 | 1.94 | 9.6 |
| 2 | 14 54.0 | 14 51.2 | 54 34.1 | 0.93 | 54 23.9 | 0.78 | 9 1.3 | 2.03 | 10.6 |
| 3 | 14 48.9 | 14 47.1 | 54 15.5 | 0.63 | 54 8.8 | 0.49 | 9 51.0 | 2.11 | 11.6 |
| 4 | 14 45.7 | 14 44.8 | 54 3.8 | 0.35 | 54 0.3 | −0.23 | 10 42.3 | 2.15 | 12.6 |
| 5 | 14 44.2 | 14 44.0 | 53 58.2 | −0.12 | 53 57.5 | 0.00 | 11 33.9 | 2.14 | 13.6 |
| 6 | 14 44.2 | 14 44.8 | 53 58.2 | +0.11 | 54 0.2 | +0.22 | 12 24.6 | 2.07 | 14.6 |
| 7 | 14 45.6 | 14 46.9 | 54 3.5 | 0.33 | 54 8.1 | 0.44 | 13 13.2 | 1.98 | 15.6 |
| 8 | 14 48.5 | 14 50.5 | 54 14.0 | 0.55 | 54 21.3 | 0.67 | 13 59.4 | 1.88 | 16.6 |
| 9 | 14 52.9 | 14 55.7 | 54 30.1 | 0.80 | 54 40.4 | 0.93 | 14 43.4 | 1.79 | 17.6 |
| 10 | 14 58.9 | 15 2.6 | 54 52.3 | 1.06 | 55 5.8 | 1.19 | 15 25.6 | 1.73 | 18.6 |
| 11 | 15 6.7 | 15 11.3 | 55 20.9 | 1.33 | 55 37.7 | 1.47 | 16 7.0 | 1.72 | 19.6 |
| 12 | 15 16.3 | 15 21.7 | 55 56.1 | 1.61 | 56 16.2 | 1.73 | 16 48.8 | 1.76 | 20.6 |
| 13 | 15 27.6 | 15 33.9 | 56 37.7 | 1.86 | 57 0.7 | 1.97 | 17 32.3 | 1.86 | 21.6 |
| 14 | 15 40.4 | 15 47.3 | 57 24.8 | 2.06 | 57 50.0 | 2.13 | 18 19.0 | 2.03 | 22.6 |
| 15 | 15 54.3 | 16 1.4 | 58 15.8 | 2.17 | 58 41.9 | 2.18 | 19 10.4 | 2.26 | 23.6 |
| 16 | 16 8.5 | 16 15.3 | 59 7.8 | 2.14 | 59 33.0 | 2.05 | 20 7.6 | 2.51 | 24.6 |
| 17 | 16 21.8 | 16 27.7 | 59 56.7 | 1.90 | 60 18.4 | 1.71 | 21 10.6 | 2.73 | 25.6 |
| 18 | 16 32.9 | 16 37.1 | 60 37.4 | 1.45 | 60 53.0 | 1.15 | 22 17.5 | 2.82 | 26.6 |
| 19 | 16 40.4 | 16 42.4 | 61 4.9 | 0.81 | 61 12.3 | +0.43 | 23 24.7 | 2.75 | 27.6 |
| 20 | 16 43.2 | 16 42.6 | 61 15.2 | +0.03 | 61 13.1 | −0.37 | ☌ | | 28.6 |
| 21 | 16 40.7 | 16 37 6 | 61 6.3 | −0.77 | 60 54.8 | 1.14 | 0 28.6 | 2.56 | 0.3 |
| 22 | 16 33.4 | 16 28.0 | 60 39.1 | 1.48 | 60 19.5 | 1.77 | 1 27.2 | 2.32 | 1.3 |
| 23 | 16 21.8 | 16 14.9 | 59 56.8 | 2.01 | 59 31.5 | 2.19 | 2 20.3 | 2.11 | 2.3 |
| 24 | 16 7.5 | 15 59.9 | 59 4.4 | 2.31 | 58 36.2 | 2.38 | 3 9.2 | 1.96 | 3.3 |
| 25 | 15 52.0 | 15 44.3 | 58 7.4 | 2.40 | 57 38.9 | 2.36 | 3 55.2 | 1.88 | 4.3 |
| 26 | 15 36.7 | 15 29.4 | 57 11.0 | 2.28 | 56 44.3 | 2.17 | 4 39.9 | 1.85 | 5.3 |
| 27 | 15 22.5 | 15 16.2 | 56 19.0 | 2.03 | 55 55.6 | 1.87 | 5 24.5 | 1.87 | 6.3 |
| 28 | 15 10.3 | 15 5.1 | 55 34.2 | 1.69 | 55 15.0 | 1.51 | 6 10.1 | 1.93 | 7.3 |
| 29 | 15 0.5 | 14 56.5 | 54 58.0 | 1.32 | 54 43.3 | 1.13 | 6 57.5 | 2.02 | 8.3 |
| 30 | 14 53.1 | 14 50.3 | 54 30.8 | 0.94 | 54 20.7 | 0.75 | 7 46.8 | 2.10 | 9.3 |
| 31 | 14 48.1 | 14 46.6 | 54 12.7 | 0.57 | 54 6.9 | 0.40 | 8 37.7 | 2.15 | 10.3 |
| 32 | 14 45.5 | 14 45.5 | 54 3.1 | −0.23 | 54 1.3 | −0.08 | 9 29.4 | 2.15 | 11.3 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SATURDAY 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 14 37 55.53 | 2.0129 | S. 19 29 4.4 | 11.021 |
| 1 | 14 39 56.40 | 2.0162 | 19 40 2.9 | 10.930 |
| 2 | 14 41 57.47 | 2.0194 | 19 50 56.0 | 10.839 |
| 3 | 14 43 58.73 | 2.0227 | 20 1 43.6 | 10.747 |
| 4 | 14 46 0.19 | 2.0260 | 20 12 25.6 | 10.653 |
| 5 | 14 48 1.85 | 2.0293 | 20 23 1.9 | 10.558 |
| 6 | 14 50 3.71 | 2.0327 | 20 33 32.5 | 10.463 |
| 7 | 14 52 5.78 | 2.0362 | 20 43 57.4 | 10.367 |
| 8 | 14 54 8.05 | 2.0395 | 20 54 16.5 | 10.269 |
| 9 | 14 56 10.52 | 2.0429 | 21 4 29.7 | 10.171 |
| 10 | 14 58 13.20 | 2.0461 | 21 14 37.0 | 10.072 |
| 11 | 15 0 16.09 | 2.0498 | 21 24 38.4 | 9.974 |
| 12 | 15 2 19.18 | 2.0533 | 21 34 33.9 | 9.875 |
| 13 | 15 4 22.48 | 2.0568 | 21 44 23.4 | 9.774 |
| 14 | 15 6 26.00 | 2.0604 | 21 54 6.8 | 9.672 |
| 15 | 15 8 29.73 | 2.0639 | 22 3 44.0 | 9.569 |
| 16 | 15 10 33.67 | 2.0674 | 22 13 15.1 | 9.467 |
| 17 | 15 12 37.82 | 2.0710 | 22 22 40.0 | 9.363 |
| 18 | 15 14 42.19 | 2.0746 | 22 31 58.7 | 9.259 |
| 19 | 15 16 46.77 | 2.0781 | 22 41 11.1 | 9.153 |
| 20 | 15 18 51.56 | 2.0816 | 22 50 17.1 | 9.047 |
| 21 | 15 20 56.56 | 2.0851 | 22 59 16.7 | 8.940 |
| 22 | 15 23 1.77 | 2.0887 | 23 8 9.9 | 8.833 |
| 23 | 15 25 7.20 | 2.0922 | S. 23 16 56.6 | 8.725 |

### SUNDAY 2.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 15 27 12.84 | 2.0957 | S. 23 25 36.9 | 8.617 |
| 1 | 15 29 18.69 | 2.0993 | 23 34 10.6 | 8.506 |
| 2 | 15 31 24.76 | 2.1029 | 23 42 37.6 | 8.395 |
| 3 | 15 33 31.04 | 2.1064 | 23 50 58.0 | 8.284 |
| 4 | 15 35 37.53 | 2.1099 | 23 59 11.7 | 8.172 |
| 5 | 15 37 44.23 | 2.1135 | 24 7 18.7 | 8.060 |
| 6 | 15 39 51.15 | 2.1171 | 24 15 18.9 | 7.947 |
| 7 | 15 41 58.28 | 2.1205 | 24 23 12.3 | 7.833 |
| 8 | 15 44 5.61 | 2.1239 | 24 30 58.8 | 7.718 |
| 9 | 15 46 13.15 | 2.1274 | 24 38 38.5 | 7.603 |
| 10 | 15 48 20.90 | 2.1306 | 24 46 11.2 | 7 487 |
| 11 | 15 50 28.85 | 2.1342 | 24 53 36.9 | 7.370 |
| 12 | 15 52 37.00 | 2.1376 | 25 0 55.6 | 7.253 |
| 13 | 15 54 45.36 | 2.1410 | 25 8 7.3 | 7.135 |
| 14 | 15 56 53.92 | 2.1443 | 25 15 11.8 | 7.016 |
| 15 | 15 59 2.68 | 2.1477 | 25 22 9.2 | 6.897 |
| 16 | 16 1 11.64 | 2.1509 | 25 28 59.4 | 6.777 |
| 17 | 16 3 20.79 | 2.1541 | 25 35 42.4 | 6.656 |
| 18 | 16 5 30.13 | 2.1573 | 25 42 18.1 | 6.534 |
| 19 | 16 7 39.67 | 2.1606 | 25 48 46.5 | 6.412 |
| 20 | 16 9 49.40 | 2.1637 | 25 55 7.6 | 6.290 |
| 21 | 16 11 59.31 | 2.1667 | 26 1 21.3 | 6.167 |
| 22 | 16 14 9.41 | 2.1698 | 26 7 27.6 | 6.043 |
| 23 | 16 16 19.69 | 2.1728 | 26 13 26.4 | 5.918 |
| 24 | 16 18 30.15 | 2.1758 | S. 26 19 17.8 | 5.794 |

### MONDAY 3.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 16 18 30.15 | 2.1758 | S. 26 19 17.8 | 5.794 |
| 1 | 16 20 40.79 | 2.1787 | 26 25 1.7 | 5.668 |
| 2 | 16 22 51.60 | 2.1817 | 26 30 38.0 | 5.542 |
| 3 | 16 25 2.59 | 2.1846 | 26 36 6.7 | 5.415 |
| 4 | 16 27 13.75 | 2.1873 | 26 41 27.8 | 5.287 |
| 5 | 16 29 25.07 | 2.1901 | 26 46 41.2 | 5.160 |
| 6 | 16 31 36.56 | 2.1928 | 26 51 47.0 | 5.032 |
| 7 | 16 33 48.21 | 2.1954 | 26 56 45.1 | 4.903 |
| 8 | 16 36 0.01 | 2.1979 | 27 1 35.4 | 4.773 |
| 9 | 16 38 11.96 | 2.2004 | 27 6 17.9 | 4.643 |
| 10 | 16 40 24.06 | 2.2029 | 27 10 52.6 | 4.513 |
| 11 | 16 42 36.31 | 2.2053 | 27 15 19.5 | 4.383 |
| 12 | 16 44 48.70 | 2.2077 | 27 19 38.5 | 4.252 |
| 13 | 16 47 1.23 | 2.2099 | 27 23 49.7 | 4.121 |
| 14 | 16 49 13.89 | 2.2121 | 27 27 53.0 | 3.988 |
| 15 | 16 51 26.68 | 2.2142 | 27 31 48.3 | 3.855 |
| 16 | 16 53 39.60 | 2.2164 | 27 35 35.6 | 3.722 |
| 17 | 16 55 52.65 | 2.2185 | 27 39 14.9 | 3.588 |
| 18 | 16 58 5.82 | 2.2204 | 27 42 46.2 | 3.455 |
| 19 | 17 0 19.10 | 2.2223 | 27 46 9.5 | 3.321 |
| 20 | 17 2 32.49 | 2.2241 | 27 49 24.7 | 3.187 |
| 21 | 17 4 45.99 | 2.2258 | 27 52 31.9 | 3.053 |
| 22 | 17 6 59.59 | 2.2274 | 27 55 31.0 | 2.918 |
| 23 | 17 9 13.28 | 2.2289 | S. 27 58 22.0 | 2.782 |

### TUESDAY 4.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 17 11 27.06 | 2.2304 | S. 28 1 4.8 | 2.645 |
| 1 | 17 13 40.93 | 2.2319 | 28 3 39.4 | 2.509 |
| 2 | 17 15 54.89 | 2.2333 | 28 6 5.9 | 2.374 |
| 3 | 17 18 8.93 | 2.2346 | 28 8 24.3 | 2.238 |
| 4 | 17 20 23.04 | 2.2357 | 28 10 34.5 | 2.101 |
| 5 | 17 22 37.22 | 2.2368 | 28 12 36.4 | 1.963 |
| 6 | 17 24 51.46 | 2.2378 | 28 14 30.1 | 1.826 |
| 7 | 17 27 5.76 | 2.2388 | 28 16 15.5 | 1.689 |
| 8 | 17 29 20.12 | 2.2397 | 28 17 52.7 | 1.552 |
| 9 | 17 31 34.53 | 2.2405 | 28 19 21.7 | 1.414 |
| 10 | 17 33 48.98 | 2.2412 | 28 20 42.4 | 1.276 |
| 11 | 17 36 3.47 | 2.2418 | 28 21 54.8 | 1.138 |
| 12 | 17 38 18.00 | 2.2424 | 28 22 59.0 | 1.001 |
| 13 | 17 40 32.56 | 2.2428 | 28 23 54.9 | 0.862 |
| 14 | 17 42 47.14 | 2.2431 | 28 24 42.5 | 0.723 |
| 15 | 17 45 1.73 | 2.2433 | 28 25 21 7 | 0.584 |
| 16 | 17 47 16.34 | 2.2436 | 28 25 52.6 | 0.447 |
| 17 | 17 49 30.96 | 2.2437 | 28 26 15.3 | 0.309 |
| 18 | 17 51 45.58 | 2.2437 | 28 26 29.7 | 0.171 |
| 19 | 17 54 0.20 | 2.2437 | 28 26 35.8 | −0.032 |
| 20 | 17 56 14.82 | 2.2436 | 28 26 33.6 | +0.107 |
| 21 | 17 58 29.43 | 2.2433 | 28 26 23.0 | 0.246 |
| 22 | 18 0 44.02 | 2.2429 | 28 26 4.1 | 0.383 |
| 23 | 18 2 58.58 | 2.2424 | 28 25 37.0 | 0.521 |
| 24 | 18 5 13.11 | 2.2419 | S. 28 25 1.6 | 0.659 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | WEDNESDAY 5. | | | | | FRIDAY 7. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 18 5 13.11 | 2.2419 | S.28 25 1.6 | 0.659 | 0 | 19 50 45.07 | 2.1298 | S.25 19 41.3 | 6.887 |
| 1 | 18 7 27.61 | 2.2413 | 28 24 17.9 | 0.797 | 1 | 19 52 52.75 | 2.1261 | 25 12 44.6 | 7.002 |
| 2 | 18 9 42.07 | 2.2407 | 28 23 25.9 | 0.935 | 2 | 19 55 0.21 | 2.1224 | 25 5 41.0 | 7.117 |
| 3 | 18 11 56.49 | 2.2399 | 28 22 25.7 | 1.073 | 3 | 19 57 7.44 | 2.1187 | 24 58 30.5 | 7.232 |
| 4 | 18 14 10.86 | 2.2390 | 28 21 17.2 | 1.211 | 4 | 19 59 14.45 | 2.1149 | 24 51 13.1 | 7.347 |
| 5 | 18 16 25.17 | 2.2380 | 28 20 0.4 | 1.348 | 5 | 20 1 21.23 | 2.1112 | 24 43 48.9 | 7.460 |
| 6 | 18 18 39.43 | 2.2371 | 28 18 35.4 | 1.486 | 6 | 20 3 27.79 | 2.1074 | 24 36 17.9 | 7.572 |
| 7 | 18 20 53.62 | 2.2360 | 28 17 2.1 | 1.622 | 7 | 20 5 34.12 | 2.1035 | 24 28 40.2 | 7.683 |
| 8 | 18 23 7.75 | 2.2348 | 28 15 20.7 | 1.758 | 8 | 20 7 40.21 | 2.0996 | 24 20 55.9 | 7.794 |
| 9 | 18 25 21.80 | 2.2335 | 28 13 31.1 | 1.895 | 9 | 20 9 46.07 | 2.0957 | 24 13 4.9 | 7.905 |
| 10 | 18 27 35.77 | 2.2322 | 28 11 33.3 | 2.032 | 10 | 20 11 51.70 | 2.0919 | 24 5 7.3 | 8.014 |
| 11 | 18 29 49.66 | 2.2308 | 28 9 27.3 | 2.168 | 11 | 20 13 57.10 | 2.0880 | 23 57 3.2 | 8.122 |
| 12 | 18 32 3.46 | 2.2293 | 28 7 13.2 | 2.303 | 12 | 20 16 2.26 | 2.0840 | 23 48 52.6 | 8.230 |
| 13 | 18 34 17.17 | 2.2277 | 28 4 50.9 | 2.439 | 13 | 20 18 7.18 | 2.0801 | 23 40 35.6 | 8.337 |
| 14 | 18 36 30.78 | 2.2259 | 28 2 20.5 | 2.574 | 14 | 20 20 11.87 | 2.0762 | 23 32 12.2 | 8.443 |
| 15 | 18 38 44.28 | 2.2241 | 27 59 42.0 | 2.709 | 15 | 20 22 16.32 | 2.0722 | 23 23 42.4 | 8.549 |
| 16 | 18 40 57.67 | 2.2223 | 27 56 55.4 | 2.843 | 16 | 20 24 20.53 | 2.0682 | 23 15 6.3 | 8.653 |
| 17 | 18 43 10.95 | 2.2204 | 27 54 0.8 | 2.978 | 17 | 20 26 24.51 | 2.0643 | 23 6 24.0 | 8.756 |
| 18 | 18 45 24.12 | 2.2185 | 27 50 58.1 | 3.112 | 18 | 20 28 28.25 | 2.0603 | 22 57 35.6 | 8.858 |
| 19 | 18 47 37.17 | 2.2164 | 27 47 47.4 | 3.245 | 19 | 20 30 31.75 | 2.0563 | 22 48 41.0 | 8.961 |
| 20 | 18 49 50.09 | 2.2143 | 27 44 28.7 | 3.377 | 20 | 20 32 35.01 | 2.0523 | 22 39 40.3 | 9.063 |
| 21 | 18 52 2.88 | 2.2121 | 27 41 2.1 | 3.510 | 21 | 20 34 38.03 | 2.0483 | 22 30 33.5 | 9.163 |
| 22 | 18 54 15.54 | 2.2098 | 27 37 27.5 | 3.643 | 22 | 20 36 40.81 | 2.0444 | 22 21 20.7 | 9.263 |
| 23 | 18 56 28.06 | 2.2074 | S.27 33 44.9 | 3.776 | 23 | 20 38 43.36 | 2.0405 | S.22 12 1.9 | 9.362 |
| | THURSDAY 6. | | | | | SATURDAY 8. | | | |
| 0 | 18 58 40.43 | 2.2050 | S.27 29 54.4 | 3.907 | 0 | 20 40 45.67 | 2.0365 | S.22 2 37.3 | 9.459 |
| 1 | 19 0 52.66 | 2.2026 | 27 25 56.1 | 4.037 | 1 | 20 42 47.74 | 2.0325 | 21 53 6.8 | 9.556 |
| 2 | 19 3 4.74 | 2.2000 | 27 21 50.0 | 4.167 | 2 | 20 44 49.57 | 2.0286 | 21 43 30.5 | 9.653 |
| 3 | 19 5 16.66 | 2.1973 | 27 17 36.1 | 4.297 | 3 | 20 46 51.17 | 2.0247 | 21 33 48.5 | 9.748 |
| 4 | 19 7 28.42 | 2.1947 | 27 13 14.4 | 4.426 | 4 | 20 48 52.53 | 2.0208 | 21 24 0.8 | 9.843 |
| 5 | 19 9 40.02 | 2.1919 | 27 8 45.0 | 4.554 | 5 | 20 50 53.66 | 2.0169 | 21 14 7.4 | 9.937 |
| 6 | 19 11 51.45 | 2.1891 | 27 4 7.9 | 4.683 | 6 | 20 52 54.56 | 2.0130 | 21 4 8.4 | 10.029 |
| 7 | 19 14 2.71 | 2.1862 | 26 59 23.1 | 4.811 | 7 | 20 54 55.22 | 2.0091 | 20 54 3.9 | 10.121 |
| 8 | 19 16 13.80 | 2.1833 | 26 54 30.6 | 4.938 | 8 | 20 56 55.65 | 2.0052 | 20 43 53.8 | 10.213 |
| 9 | 19 18 24.71 | 2.1803 | 26 49 30.5 | 5.064 | 9 | 20 58 55.85 | 2.0014 | 20 33 38.3 | 10.303 |
| 10 | 19 20 35.44 | 2.1773 | 26 44 22.9 | 5.190 | 10 | 21 0 55.82 | 1.9976 | 20 23 17.4 | 10.393 |
| 11 | 19 22 45.99 | 2.1743 | 26 39 7.7 | 5.316 | 11 | 21 2 55.56 | 1.9937 | 20 12 51.1 | 10.482 |
| 12 | 19 24 56.36 | 2.1712 | 26 33 45.0 | 5.440 | 12 | 21 4 55.06 | 1.9899 | 20 2 19.6 | 10.569 |
| 13 | 19 27 6.53 | 2.1679 | 26 28 14.9 | 5.564 | 13 | 21 6 54.34 | 1.9862 | 19 51 42.8 | 10.656 |
| 14 | 19 29 16.51 | 2.1646 | 26 22 37.3 | 5.688 | 14 | 21 8 53.40 | 1.9824 | 19 41 0.8 | 10.743 |
| 15 | 19 31 26.29 | 2.1613 | 26 16 52.3 | 5.811 | 15 | 21 10 52.23 | 1.9787 | 19 30 13.7 | 10.828 |
| 16 | 19 33 35.87 | 2.1580 | 26 11 0.0 | 5.933 | 16 | 21 12 50.84 | 1.9750 | 19 19 21.5 | 10.913 |
| 17 | 19 35 45.25 | 2.1547 | 26 5 0.4 | 6.055 | 17 | 21 14 49.23 | 1.9714 | 19 8 24.2 | 10.997 |
| 18 | 19 37 54.43 | 2.1512 | 25 58 53.4 | 6.177 | 18 | 21 16 47.41 | 1.9678 | 18 57 21.9 | 11.079 |
| 19 | 19 40 3.40 | 2.1477 | 25 52 39.2 | 6.296 | 19 | 21 18 45.37 | 1.9642 | 18 46 14.7 | 11.161 |
| 20 | 19 42 12.16 | 2.1442 | 25 46 17.9 | 6.415 | 20 | 21 20 43.11 | 1.9606 | 18 35 2.6 | 11.242 |
| 21 | 19 44 20.71 | 2.1407 | 25 39 49.4 | 6.534 | 21 | 21 22 40.64 | 1.9571 | 18 23 45.6 | 11.322 |
| 22 | 19 46 29.05 | 2.1372 | 25 33 13.8 | 6.653 | 22 | 21 24 37.96 | 1.9535 | 18 12 23.9 | 11.402 |
| 23 | 19 48 37.17 | 2.1335 | 25 26 31.1 | 6.771 | 23 | 21 26 35.06 | 1.9500 | 18 0 57.4 | 11.481 |
| 24 | 19 50 45.07 | 2.1298 | S.25 19 41.3 | 6.887 | 24 | 21 28 31.96 | 1.9466 | S.17 49 26.2 | 11.558 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SUNDAY 9.

| Hour | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 21 28 31.96 | 1.9466 | S. 17 49 26.2 | 11.558 |
| 1 | 21 30 28.66 | 1.9432 | 17 37 50.4 | 11.635 |
| 2 | 21 32 25.15 | 1.9398 | 17 26 10.0 | 11.712 |
| 3 | 21 34 21.44 | 1.9366 | 17 14 25.0 | 11.787 |
| 4 | 21 36 17.54 | 1.9333 | 17 2 35.5 | 11.862 |
| 5 | 21 38 13.44 | 1.9301 | 16 50 41.6 | 11.935 |
| 6 | 21 40 9.15 | 1.9269 | 16 38 43.3 | 12.007 |
| 7 | 21 42 4.67 | 1.9237 | 16 26 40.7 | 12.079 |
| 8 | 21 44 0.00 | 1.9206 | 16 14 33.8 | 12.151 |
| 9 | 21 45 55.14 | 1.9175 | 16 2 22.6 | 12.222 |
| 10 | 21 47 50.10 | 1.9145 | 15 50 7.2 | 12.291 |
| 11 | 21 49 44.88 | 1.9116 | 15 37 47.7 | 12.359 |
| 12 | 21 51 39.49 | 1.9087 | 15 25 24.1 | 12.427 |
| 13 | 21 53 33.92 | 1.9058 | 15 12 56.4 | 12.495 |
| 14 | 21 55 28.18 | 1.9030 | 15 0 24.7 | 12.561 |
| 15 | 21 57 22.28 | 1.9002 | 14 47 49.1 | 12.626 |
| 16 | 21 59 16.21 | 1.8975 | 14 35 9.6 | 12.690 |
| 17 | 22 1 9.98 | 1.8948 | 14 22 26.3 | 12.754 |
| 18 | 22 3 3.59 | 1.8922 | 14 9 39.2 | 12.817 |
| 19 | 22 4 57.05 | 1.8897 | 13 56 48.3 | 12.879 |
| 20 | 22 6 50.36 | 1.8872 | 13 43 53.7 | 12.941 |
| 21 | 22 8 43.51 | 1.8847 | 13 30 55.4 | 13.002 |
| 22 | 22 10 36.52 | 1.8823 | 13 17 53.5 | 13.061 |
| 23 | 22 12 29.39 | 1.8800 | S. 13 4 48.1 | 13.119 |

### MONDAY 10.

| Hour | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 22 14 22.12 | 1.8778 | S. 12 51 39.2 | 13.177 |
| 1 | 22 16 14.72 | 1.8756 | 12 38 26.8 | 13.235 |
| 2 | 22 18 7.19 | 1.8734 | 12 25 11.0 | 13.292 |
| 3 | 22 19 59.53 | 1.8713 | 12 11 51.8 | 13.347 |
| 4 | 22 21 51.74 | 1.8692 | 11 58 29.3 | 13.402 |
| 5 | 22 23 43.83 | 1.8672 | 11 45 3.5 | 13.457 |
| 6 | 22 25 35.80 | 1.8653 | 11 31 34.5 | 13.510 |
| 7 | 22 27 27.66 | 1.8635 | 11 18 2.3 | 13.562 |
| 8 | 22 29 19.42 | 1.8617 | 11 4 27.0 | 13.614 |
| 9 | 22 31 11.07 | 1.8600 | 10 50 48.6 | 13.665 |
| 10 | 22 33 2.62 | 1.8583 | 10 37 7.2 | 13.715 |
| 11 | 22 34 54.07 | 1.8567 | 10 23 22.8 | 13.764 |
| 12 | 22 36 45.43 | 1.8552 | 10 9 35.5 | 13.813 |
| 13 | 22 38 36.70 | 1.8537 | 9 55 45.3 | 13.861 |
| 14 | 22 40 27.88 | 1.8523 | 9 41 52.2 | 13.908 |
| 15 | 22 42 18.98 | 1.8510 | 9 27 56.3 | 13.954 |
| 16 | 22 44 10.00 | 1.8498 | 9 13 57.7 | 13.999 |
| 17 | 22 46 0.95 | 1.8486 | 8 59 56.4 | 14.044 |
| 18 | 22 47 51.83 | 1.8475 | 8 45 52.4 | 14.088 |
| 19 | 22 49 42.65 | 1.8461 | 8 31 45.8 | 14.132 |
| 20 | 22 51 33.40 | 1.8453 | 8 17 36.6 | 14.174 |
| 21 | 22 53 24.09 | 1.8444 | 8 3 24.9 | 14.215 |
| 22 | 22 55 14.73 | 1.8437 | 7 49 10.8 | 14.256 |
| 23 | 22 57 5.33 | 1.8429 | 7 34 54.2 | 14.296 |
| 24 | 22 58 55.88 | 1.8422 | S. 7 20 35.3 | 14.334 |

### TUESDAY 11.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 22 58 55.88 | 1.8422 | S. 7 20 35.3 | 14.334 |
| 1 | 23 0 46.39 | 1.8416 | 7 6 14.1 | 14.373 |
| 2 | 23 2 36.87 | 1.8410 | 6 51 50.6 | 14.411 |
| 3 | 23 4 27.31 | 1.8405 | 6 37 24.8 | 14.448 |
| 4 | 23 6 17.73 | 1.8401 | 6 22 56.8 | 14.483 |
| 5 | 23 8 8.13 | 1.8398 | 6 8 26.8 | 14.518 |
| 6 | 23 9 58.51 | 1.8396 | 5 53 54.7 | 14.553 |
| 7 | 23 11 48.88 | 1.8394 | 5 39 20.5 | 14.587 |
| 8 | 23 13 39.24 | 1.8393 | 5 24 44.3 | 14.619 |
| 9 | 23 15 29.60 | 1.8393 | 5 10 6.2 | 14.651 |
| 10 | 23 17 19.96 | 1.8394 | 4 55 26.2 | 14.682 |
| 11 | 23 19 10.33 | 1.8395 | 4 40 44.4 | 14.712 |
| 12 | 23 21 0.70 | 1.8397 | 4 26 0.7 | 14.742 |
| 13 | 23 22 51.09 | 1.8400 | 4 11 15.3 | 14.771 |
| 14 | 23 24 41.50 | 1.8404 | 3 56 28.2 | 14.798 |
| 15 | 23 26 31.94 | 1.8409 | 3 41 39.5 | 14.825 |
| 16 | 23 28 22.41 | 1.8414 | 3 26 49.2 | 14.852 |
| 17 | 23 30 12.91 | 1.8420 | 3 11 57.3 | 14.878 |
| 18 | 23 32 3.45 | 1.8427 | 2 57 3.8 | 14.903 |
| 19 | 23 33 54.03 | 1.8434 | 2 42 8.9 | 14.927 |
| 20 | 23 35 44.66 | 1.8443 | 2 27 12.6 | 14.949 |
| 21 | 23 37 35.35 | 1.8453 | 2 12 15.0 | 14.971 |
| 22 | 23 39 26.10 | 1.8463 | 1 57 16.0 | 14.993 |
| 23 | 23 41 16.91 | 1.8474 | S. 1 42 15.8 | 15.013 |

### WEDNESDAY 12.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 23 43 7.79 | 1.8486 | S. 1 27 14.4 | 15.033 |
| 1 | 23 44 58.74 | 1.8499 | 1 12 11.8 | 15.052 |
| 2 | 23 46 49.78 | 1.8513 | 0 57 8.1 | 15.070 |
| 3 | 23 48 40.90 | 1.8527 | 0 42 3.4 | 15.087 |
| 4 | 23 50 32.11 | 1.8542 | 0 26 57.7 | 15.103 |
| 5 | 23 52 23.41 | 1.8558 | S. 0 11 51.0 | 15.119 |
| 6 | 23 54 14.81 | 1.8576 | N. 0 3 16.6 | 15.133 |
| 7 | 23 56 6.32 | 1.8594 | 0 18 25.0 | 15.147 |
| 8 | 23 57 57.94 | 1.8613 | 0 33 34.2 | 15.160 |
| 9 | 23 59 49.67 | 1.8632 | 0 48 44.2 | 15.172 |
| 10 | 0 1 41.52 | 1.8652 | 1 3 54.8 | 15.183 |
| 11 | 0 3 33.50 | 1.8674 | 1 19 6.1 | 15.193 |
| 12 | 0 5 25.61 | 1.8697 | 1 34 18.0 | 15.203 |
| 13 | 0 7 17.86 | 1.8720 | 1 49 30.4 | 15.211 |
| 14 | 0 9 10.25 | 1.8743 | 2 4 43.3 | 15.217 |
| 15 | 0 11 2.78 | 1.8768 | 2 19 56.5 | 15.223 |
| 16 | 0 12 55.47 | 1.8795 | 2 35 10.1 | 15.229 |
| 17 | 0 14 48.32 | 1.8822 | 2 50 24.0 | 15.234 |
| 18 | 0 16 41.33 | 1.8849 | 3 5 38.2 | 15.238 |
| 19 | 0 18 34.51 | 1.8878 | 3 20 52.6 | 15.241 |
| 20 | 0 20 27.87 | 1.8907 | 3 36 7.1 | 15.242 |
| 21 | 0 22 21.40 | 1.8937 | 3 51 21.6 | 15.242 |
| 22 | 0 24 15.12 | 1.8969 | 4 6 36.1 | 15.242 |
| 23 | 0 26 9.03 | 1.9002 | 4 21 50.6 | 15.242 |
| 24 | 0 28 3.14 | 1.9035 | N. 4 37 5.1 | 15.240 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| THURSDAY 13. | | | | | SATURDAY 15. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 0 28 3.14 | 1.9035 | N. 4 37 5.1 | 15.240 | 0 | 2 5 3.85 | 2.1751 | N.16 24 0.4 | 13.710 |
| 1 | 0 29 57.45 | 1.9069 | 4 52 19.4 | 15.236 | 1 | 2 7 14.59 | 2.1830 | 16 37 41.0 | 13.642 |
| 2 | 0 31 51.97 | 1.9104 | 5 7 33.4 | 15.231 | 2 | 2 9 25.81 | 2.1910 | 16 51 17.4 | 13.572 |
| 3 | 0 33 46.70 | 1.9140 | 5 22 47.1 | 15.226 | 3 | 2 11 37.51 | 2.1990 | 17 4 49.6 | 13.502 |
| 4 | 0 35 41.65 | 1.9177 | 5 38 0.5 | 15.219 | 4 | 2 13 49.69 | 2.2072 | 17 18 17.6 | 13.429 |
| 5 | 0 37 36.83 | 1.9216 | 5 53 13.4 | 15.211 | 5 | 2 16 2.37 | 2.2154 | 17 31 41.1 | 13.354 |
| 6 | 0 39 32.24 | 1.9255 | 6 8 25.8 | 15.202 | 6 | 2 18 15.54 | 2.2237 | 17 45 0.1 | 13.278 |
| 7 | 0 41 27.89 | 1.9295 | 6 23 37.7 | 15.193 | 7 | 2 20 29.21 | 2.2321 | 17 58 14.5 | 13.200 |
| 8 | 0 43 23.78 | 1.9335 | 6 38 49.0 | 15.182 | 8 | 2 22 43.39 | 2.2406 | 18 11 24.1 | 13.120 |
| 9 | 0 45 19.91 | 1.9377 | 6 53 59.6 | 15.170 | 9 | 2 24 58.08 | 2.2491 | 18 24 28.9 | 13.038 |
| 10 | 0 47 16.30 | 1.9420 | 7 9 9.4 | 15.158 | 10 | 2 27 13.28 | 2.2577 | 18 37 28.7 | 12.955 |
| 11 | 0 49 12.95 | 1.9463 | 7 24 18.5 | 15.144 | 11 | 2 29 29.00 | 2.2663 | 18 50 23.5 | 12.870 |
| 12 | 0 51 9.86 | 1.9507 | 7 39 26.7 | 15.128 | 12 | 2 31 45.24 | 2.2750 | 19 3 13.1 | 12.782 |
| 13 | 0 53 7.04 | 1.9553 | 7 54 33.9 | 15.112 | 13 | 2 34 2.00 | 2.2838 | 19 15 57.4 | 12.693 |
| 14 | 0 55 4.50 | 1.9601 | 8 9 40.1 | 15.095 | 14 | 2 36 19.29 | 2.2927 | 19 28 36.3 | 12.602 |
| 15 | 0 57 2.25 | 1.9648 | 8 24 45.3 | 15.077 | 15 | 2 38 37.12 | 2.3016 | 19 41 9.6 | 12.508 |
| 16 | 0 59 0.28 | 1.9696 | 8 39 49.3 | 15.057 | 16 | 2 40 55.48 | 2.3105 | 19 53 37.3 | 12.413 |
| 17 | 1 0 58.60 | 1.9746 | 8 54 52.1 | 15.035 | 17 | 2 43 14.38 | 2.3195 | 20 5 59.2 | 12.316 |
| 18 | 1 2 57.23 | 1.9797 | 9 9 53.5 | 15.013 | 18 | 2 45 33.82 | 2.3286 | 20 18 15.2 | 12.218 |
| 19 | 1 4 56.16 | 1.9848 | 9 24 53.6 | 14.990 | 19 | 2 47 53.81 | 2.3377 | 20 30 25.3 | 12.117 |
| 20 | 1 6 55.40 | 1.9900 | 9 39 52.3 | 14.965 | 20 | 2 50 14.34 | 2.3468 | 20 42 29.2 | 12.013 |
| 21 | 1 8 54.96 | 1.9953 | 9 54 49.4 | 14.939 | 21 | 2 52 35.42 | 2.3559 | 20 54 26.8 | 11.908 |
| 22 | 1 10 54.84 | 2.0007 | 10 9 44.9 | 14.912 | 22 | 2 54 57.05 | 2.3652 | 21 6 18.1 | 11.801 |
| 23 | 1 12 55.05 | 2.0063 | N.10 24 38.8 | 14.883 | 23 | 2 57 19.24 | 2.3745 | N.21 18 2.9 | 11.691 |
| FRIDAY 14. | | | | | SUNDAY 16. | | | | |
| 0 | 1 14 55.60 | 2.0120 | N.10 39 30.9 | 14.853 | 0 | 2 59 41.99 | 2.3838 | N.21 29 41.0 | 11.579 |
| 1 | 1 16 56.49 | 2.0177 | 10 54 21.2 | 14.822 | 1 | 3 2 5.30 | 2.3932 | 21 41 12.4 | 11.467 |
| 2 | 1 18 57.72 | 2.0234 | 11 9 9.6 | 14.790 | 2 | 3 4 29.17 | 2.4025 | 21 52 37.0 | 11.352 |
| 3 | 1 20 59.30 | 2.0293 | 11 23 56.0 | 14.757 | 3 | 3 6 53.60 | 2.4119 | 22 3 54.6 | 11.234 |
| 4 | 1 23 1.24 | 2.0354 | 11 38 40.4 | 14.722 | 4 | 3 9 18.60 | 2.4213 | 22 15 5.1 | 11.114 |
| 5 | 1 25 3.55 | 2.0415 | 11 53 22.6 | 14.685 | 5 | 3 11 44.16 | 2.4307 | 22 26 8.3 | 10.992 |
| 6 | 1 27 6.22 | 2.0476 | 12 8 2.6 | 14.647 | 6 | 3 14 10.28 | 2.4401 | 22 37 4.1 | 10.867 |
| 7 | 1 29 9.26 | 2.0539 | 12 22 40.3 | 14.608 | 7 | 3 16 36.97 | 2.4496 | 22 47 52.3 | 10.740 |
| 8 | 1 31 12.69 | 2.0604 | 12 37 15.6 | 14.567 | 8 | 3 19 4.23 | 2.4591 | 22 58 32.9 | 10.612 |
| 9 | 1 33 16.51 | 2.0669 | 12 51 48.3 | 14.524 | 9 | 3 21 32.06 | 2.4686 | 23 9 5.8 | 10.482 |
| 10 | 1 35 20.72 | 2.0734 | 13 6 18.5 | 14.481 | 10 | 3 24 0.46 | 2.4780 | 23 19 30.8 | 10.350 |
| 11 | 1 37 25.32 | 2.0801 | 13 20 46.0 | 14.436 | 11 | 3 26 29.42 | 2.4874 | 23 29 47.8 | 10.215 |
| 12 | 1 39 30.33 | 2.0869 | 13 35 10.8 | 14.390 | 12 | 3 28 58.95 | 2.4969 | 23 39 56.6 | 10.077 |
| 13 | 1 41 35.75 | 2.0938 | 13 49 32.8 | 14.342 | 13 | 3 31 29.05 | 2.5063 | 23 49 57.1 | 9.938 |
| 14 | 1 43 41.58 | 2.1007 | 14 3 51.8 | 14.292 | 14 | 3 33 59.71 | 2.5157 | 23 59 49.2 | 9.797 |
| 15 | 1 45 47.83 | 2.1077 | 14 18 7.8 | 14.241 | 15 | 3 36 30.93 | 2.5251 | 24 9 32.8 | 9.654 |
| 16 | 1 47 54.50 | 2.1148 | 14 32 20.7 | 14.188 | 16 | 3 39 2.72 | 2.5345 | 24 19 7.7 | 9.508 |
| 17 | 1 50 1.61 | 2.1221 | 14 46 30.4 | 14.134 | 17 | 3 41 35.07 | 2.5438 | 24 28 33.8 | 9.361 |
| 18 | 1 52 9.15 | 2.1294 | 15 0 36.8 | 14.078 | 18 | 3 44 7.97 | 2.5530 | 24 37 51.0 | 9.211 |
| 19 | 1 54 17.13 | 2.1367 | 15 14 39.8 | 14.021 | 19 | 3 46 41.43 | 2.5623 | 24 46 59.1 | 9.058 |
| 20 | 1 56 25.56 | 2.1442 | 15 28 39.3 | 13.962 | 20 | 3 49 15.45 | 2.5716 | 24 55 58.0 | 8.904 |
| 21 | 1 58 34.44 | 2.1518 | 15 42 35.2 | 13.901 | 21 | 3 51 50.02 | 2.5807 | 25 4 47.6 | 8.748 |
| 22 | 2 0 43.78 | 2.1595 | 15 56 27.4 | 13.838 | 22 | 3 54 25.13 | 2.5897 | 25 13 27.8 | 8.590 |
| 23 | 2 2 53.58 | 2.1673 | 16 10 15.8 | 13.775 | 23 | 3 57 0.78 | 2.5987 | 25 21 58.4 | 8.428 |
| 24 | 2 5 3.85 | 2.1751 | N.16 24 0.4 | 13.710 | 24 | 3 59 36.97 | 2.6077 | N.25 30 19.2 | 8.265 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### MONDAY 17.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 3 59 36.97 | 2.6077 | N.25 30 19.2 | 8.265 |
| 1 | 4 2 13.70 | 2.6166 | 25 38 30.2 | 8.100 |
| 2 | 4 4 50.96 | 2.6254 | 25 46 31.2 | 7.933 |
| 3 | 4 7 28.75 | 2.6342 | 25 54 22.2 | 7.765 |
| 4 | 4 10 7.06 | 2.6428 | 26 2 3.0 | 7.593 |
| 5 | 4 12 45.88 | 2.6512 | 26 9 33.4 | 7.420 |
| 6 | 4 15 25.21 | 2.6597 | 26 16 53.4 | 7.245 |
| 7 | 4 18 5.05 | 2.6681 | 26 24 2.8 | 7.067 |
| 8 | 4 20 45.38 | 2.6763 | 26 31 1.5 | 6.888 |
| 9 | 4 23 26.20 | 2.6844 | 26 37 49.4 | 6.707 |
| 10 | 4 26 7.51 | 2.6925 | 26 44 26.4 | 6.524 |
| 11 | 4 28 49.30 | 2.7003 | 26 50 52.3 | 6.338 |
| 12 | 4 31 31.55 | 2.7080 | 26 57 7.0 | 6.152 |
| 13 | 4 34 14.26 | 2.7157 | 27 3 10.5 | 5.963 |
| 14 | 4 36 57.43 | 2.7232 | 27 9 2.6 | 5.772 |
| 15 | 4 39 41.04 | 2.7304 | 27 14 43.1 | 5.579 |
| 16 | 4 42 25.08 | 2.7376 | 27 20 12.0 | 5.385 |
| 17 | 4 45 9.55 | 2.7446 | 27 25 29.3 | 5.190 |
| 18 | 4 47 54.43 | 2.7514 | 27 30 34.8 | 4.992 |
| 19 | 4 50 39.72 | 2.7581 | 27 35 28.4 | 4.792 |
| 20 | 4 53 25.40 | 2.7646 | 27 40 9.9 | 4.591 |
| 21 | 4 56 11.47 | 2.7709 | 27 44 39.3 | 4.388 |
| 22 | 4 58 57.91 | 2.7771 | 27 48 56.5 | 4.184 |
| 23 | 5 1 44.72 | 2.7831 | N.27 53 1.4 | 3.979 |

### TUESDAY 18.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 5 4 31.88 | 2.7888 | N.27 56 54.0 | 3.772 |
| 1 | 5 7 19.38 | 2.7944 | 28 0 34.1 | 3.564 |
| 2 | 5 10 7.21 | 2.7997 | 28 4 1.7 | 3.354 |
| 3 | 5 12 55.35 | 2.8049 | 28 7 16.6 | 3.142 |
| 4 | 5 15 43.80 | 2.8099 | 28 10 18.8 | 2.930 |
| 5 | 5 18 32.54 | 2.8147 | 28 13 8.2 | 2.717 |
| 6 | 5 21 21.56 | 2.8192 | 28 15 44.8 | 2.503 |
| 7 | 5 24 10.84 | 2.8234 | 28 18 8.5 | 2.287 |
| 8 | 5 27 0.37 | 2.8275 | 28 20 19.2 | 2.069 |
| 9 | 5 29 50.14 | 2.8314 | 28 22 16.8 | 1.851 |
| 10 | 5 32 40.14 | 2.8350 | 28 24 1.3 | 1.632 |
| 11 | 5 35 30.34 | 2.8383 | 28 25 32.7 | 1.413 |
| 12 | 5 38 20.74 | 2.8416 | 28 26 50.9 | 1.192 |
| 13 | 5 41 11.33 | 2.8445 | 28 27 55.8 | 0.971 |
| 14 | 5 44 2.08 | 2.8471 | 28 28 47.4 | 0.750 |
| 15 | 5 46 52.98 | 2.8495 | 28 29 25.8 | 0.528 |
| 16 | 5 49 44.02 | 2.8517 | 28 29 50.8 | 0.304 |
| 17 | 5 52 35.19 | 2.8537 | 28 30 2.3 | +0.080 |
| 18 | 5 55 26.47 | 2.8554 | 28 30 0.4 | −0.143 |
| 19 | 5 58 17.84 | 2.8568 | 28 29 45.1 | 0.367 |
| 20 | 6 1 9.29 | 2.8581 | 28 29 16.3 | 0.592 |
| 21 | 6 4 0.81 | 2.8591 | 28 28 34.0 | 0.817 |
| 22 | 6 6 52.38 | 2.8597 | 28 27 38.2 | 1.042 |
| 23 | 6 9 43.98 | 2.8602 | 28 26 28.9 | 1.267 |
| 24 | 6 12 35.60 | 2.8604 | N.28 25 6.2 | 1.492 |

### WEDNESDAY 19.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 6 12 35.60 | 2.8604 | N.28 25 6.2 | 1.492 |
| 1 | 6 15 27.23 | 2.8603 | 28 23 29.9 | 1.717 |
| 2 | 6 18 18.84 | 2.8600 | 28 21 40.1 | 1.942 |
| 3 | 6 21 10.43 | 2.8595 | 28 19 36.8 | 2.167 |
| 4 | 6 24 1.98 | 2.8587 | 28 17 20.0 | 2.392 |
| 5 | 6 26 53.47 | 2.8575 | 28 14 49.7 | 2.617 |
| 6 | 6 29 44.88 | 2.8562 | 28 12 6.0 | 2.841 |
| 7 | 6 32 36.21 | 2.8547 | 28 9 8.8 | 3.065 |
| 8 | 6 35 27.44 | 2.8529 | 28 5 58.2 | 3.288 |
| 9 | 6 38 18.56 | 2.8509 | 28 2 34.3 | 3.510 |
| 10 | 6 41 9.55 | 2.8486 | 27 58 57.0 | 3.732 |
| 11 | 6 44 0.39 | 2.8461 | 27 55 6.5 | 3.953 |
| 12 | 6 46 51.08 | 2.8434 | 27 51 2.7 | 4.173 |
| 13 | 6 49 41.60 | 2.8404 | 27 46 45.7 | 4.393 |
| 14 | 6 52 31.93 | 2.8371 | 27 42 15.5 | 4.612 |
| 15 | 6 55 22.05 | 2.8336 | 27 37 32.3 | 4.829 |
| 16 | 6 58 11.96 | 2.8300 | 27 32 36.0 | 5.046 |
| 17 | 7 1 1.65 | 2.8262 | 27 27 26.7 | 5.262 |
| 18 | 7 3 51.10 | 2.8220 | 27 22 4.6 | 5.476 |
| 19 | 7 6 40.29 | 2.8177 | 27 16 29.6 | 5.690 |
| 20 | 7 9 29.22 | 2.8132 | 27 10 41.8 | 5.902 |
| 21 | 7 12 17.87 | 2.8084 | 27 4 41.4 | 6.112 |
| 22 | 7 15 6.23 | 2.8035 | 26 58 28.4 | 6.322 |
| 23 | 7 17 54.29 | 2.7984 | N.26 52 2.8 | 6.531 |

### THURSDAY 20.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 7 20 42.04 | 2.7931 | N.26 45 24.7 | 6.738 |
| 1 | 7 23 29.46 | 2.7876 | 26 38 34.3 | 6.943 |
| 2 | 7 26 16.55 | 2.7819 | 26 31 31.6 | 7.146 |
| 3 | 7 29 3.29 | 2.7760 | 26 24 16.8 | 7.347 |
| 4 | 7 31 49.67 | 2.7700 | 26 16 49.9 | 7.547 |
| 5 | 7 34 35.69 | 2.7638 | 26 9 11.1 | 7.746 |
| 6 | 7 37 21.33 | 2.7575 | 26 1 20.4 | 7.943 |
| 7 | 7 40 6.59 | 2.7510 | 25 53 17.9 | 8.138 |
| 8 | 7 42 51.45 | 2.7443 | 25 45 3.8 | 8.331 |
| 9 | 7 45 35.90 | 2.7374 | 25 36 38.2 | 8.522 |
| 10 | 7 48 19.94 | 2.7305 | 25 28 1.1 | 8.712 |
| 11 | 7 51 3.56 | 2.7235 | 25 19 12.7 | 8.899 |
| 12 | 7 53 46.76 | 2.7163 | 25 10 13.2 | 9.084 |
| 13 | 7 56 29.52 | 2.7089 | 25 1 2.6 | 9.268 |
| 14 | 7 59 11.83 | 2.7014 | 24 51 41.0 | 9.450 |
| 15 | 8 1 53.69 | 2.6938 | 24 42 8.6 | 9.629 |
| 16 | 8 4 35.09 | 2.6862 | 24 32 25.5 | 9.806 |
| 17 | 8 7 16.03 | 2.6784 | 24 22 31.9 | 9.981 |
| 18 | 8 9 56.50 | 2.6705 | 24 12 27.8 | 10.154 |
| 19 | 8 12 36.49 | 2.6625 | 24 2 13.4 | 10.324 |
| 20 | 8 15 16.00 | 2.6544 | 23 51 48.9 | 10.492 |
| 21 | 8 17 55.02 | 2.6463 | 23 41 14.3 | 10.659 |
| 22 | 8 20 33.55 | 2.6381 | 23 30 29.8 | 10.823 |
| 23 | 8 23 11.59 | 2.6298 | 23 19 35.5 | 10.966 |
| 24 | 8 25 49.13 | 2.6214 | N.23 8 31.6 | 11.144 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | FRIDAY 21. | | | | | SUNDAY 23. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 8 25 49.13 | 2.6214 | N.23 8 31.6 | 11.144 | 0 | 10 21 48.31 | 2.2238 | N.11 55 36.7 | 15.993 |
| 1 | 8 28 26.16 | 2.6129 | 22 57 18.2 | 11.301 | 1 | 10 24 1.53 | 2.2168 | 11 39 35.7 | 16.039 |
| 2 | 8 31 2.68 | 2.6045 | 22 45 55.5 | 11.455 | 2 | 10 26 14.33 | 2.2099 | 11 23 32.0 | 16.082 |
| 3 | 8 33 38.70 | 2.5960 | 22 34 23.6 | 11.607 | 3 | 10 28 26.72 | 2.2031 | 11 7 25.8 | 16.124 |
| 4 | 8 36 14.20 | 2.5874 | 22 22 42.6 | 11.757 | 4 | 10 30 38.70 | 2.1963 | 10 51 17.1 | 16.164 |
| 5 | 8 38 49.19 | 2.5788 | 22 10 52.7 | 11.904 | 5 | 10 32 50.28 | 2.1898 | 10 35 6.1 | 16.202 |
| 6 | 8 41 23.66 | 2.5702 | 21 58 54.1 | 12.049 | 6 | 10 35 1.48 | 2.1834 | 10 18 52.9 | 16.238 |
| 7 | 8 43 57.61 | 2.5615 | 21 46 46.8 | 12.192 | 7 | 10 37 12.29 | 2.1769 | 10 2 37.5 | 16.272 |
| 8 | 8 46 31.04 | 2.5527 | 21 34 31.0 | 12.332 | 8 | 10 39 22.71 | 2.1705 | 9 46 20.2 | 16.304 |
| 9 | 8 49 3.94 | 2.5440 | 21 22 6.9 | 12.470 | 9 | 10 41 32.75 | 2.1643 | 9 30 1.0 | 16.335 |
| 10 | 8 51 36.32 | 2.5352 | 21 9 34.6 | 12.605 | 10 | 10 43 42.42 | 2.1582 | 9 13 40.0 | 16.363 |
| 11 | 8 54 8.17 | 2.5264 | 20 56 54.3 | 12.738 | 11 | 10 45 51.73 | 2.1521 | 8 57 17.4 | 16.390 |
| 12 | 8 56 39.49 | 2.5177 | 20 44 6.0 | 12.869 | 12 | 10 48 0.67 | 2.1461 | 8 40 53.2 | 16.415 |
| 13 | 8 59 10.29 | 2.5089 | 20 31 10.0 | 12.997 | 13 | 10 50 9.26 | 2.1402 | 8 24 27.6 | 16.438 |
| 14 | 9 1 40.56 | 2.5002 | 20 18 6.4 | 13.123 | 14 | 10 52 17.50 | 2.1344 | 8 8 0.6 | 16.460 |
| 15 | 9 4 10.31 | 2.4914 | 20 4 55.3 | 13.247 | 15 | 10 54 25.39 | 2.1287 | 7 51 32.4 | 16.479 |
| 16 | 9 6 39.53 | 2.4826 | 19 51 36.8 | 13.367 | 16 | 10 56 32.95 | 2.1232 | 7 35 3.1 | 16.497 |
| 17 | 9 9 8.22 | 2.4738 | 19 38 11.2 | 13.485 | 17 | 10 58 40.18 | 2.1177 | 7 18 32.8 | 16.513 |
| 18 | 9 11 36.38 | 2.4650 | 19 24 38.6 | 13.601 | 18 | 11 0 47.08 | 2.1122 | 7 2 1.6 | 16.527 |
| 19 | 9 14 4.02 | 2.4563 | 19 10 59.1 | 13.714 | 19 | 11 2 53.65 | 2.1069 | 6 45 29.6 | 16.539 |
| 20 | 9 16 31.14 | 2.4476 | 18 57 12.9 | 13.826 | 20 | 11 4 59.91 | 2.1017 | 6 28 56.9 | 16.551 |
| 21 | 9 18 57.73 | 2.4388 | 18 43 20.0 | 13.935 | 21 | 11 7 5.86 | 2.0967 | 6 12 23.5 | 16.561 |
| 22 | 9 21 23.80 | 2.4302 | 18 29 20.7 | 14.041 | 22 | 11 9 11.51 | 2.0917 | 5 55 49.6 | 16.568 |
| 23 | 9 23 49.36 | 2.4217 | N.18 15 15.1 | 14.145 | 23 | 11 11 16.86 | 2.0867 | N. 5 39 15.3 | 16.574 |
| | SATURDAY 22. | | | | | MONDAY 24. | | | |
| 0 | 9 26 14.40 | 2.4131 | N.18 1 3.3 | 14.247 | 0 | 11 13 21.91 | 2.0818 | N. 5 22 40.7 | 16.578 |
| 1 | 9 28 38.93 | 2.4045 | 17 46 45.5 | 14.345 | 1 | 11 15 26.68 | 2.0772 | 5 6 5.9 | 16.582 |
| 2 | 9 31 2.94 | 2.3959 | 17 32 21.9 | 14.442 | 2 | 11 17 31.17 | 2.0726 | 4 49 30.9 | 16.583 |
| 3 | 9 33 26.44 | 2.3874 | 17 17 52.5 | 14.537 | 3 | 11 19 35.39 | 2.0681 | 4 32 55.9 | 16.583 |
| 4 | 9 35 49.43 | 2.3790 | 17 3 17.5 | 14.628 | 4 | 11 21 39.34 | 2.0637 | 4 16 20.9 | 16.582 |
| 5 | 9 38 11.92 | 2.3707 | 16 48 37.1 | 14.717 | 5 | 11 23 43.03 | 2.0593 | 3 59 46.0 | 16.579 |
| 6 | 9 40 33.91 | 2.3623 | 16 33 51.5 | 14.803 | 6 | 11 25 46.46 | 2.0551 | 3 43 11.4 | 16.574 |
| 7 | 9 42 55.40 | 2.3541 | 16 19 0.7 | 14.889 | 7 | 11 27 49.64 | 2.0510 | 3 26 37.1 | 16.568 |
| 8 | 9 45 16.40 | 2.3459 | 16 4 4.8 | 14.972 | 8 | 11 29 52.58 | 2.0470 | 3 10 3.2 | 16.562 |
| 9 | 9 47 36.91 | 2.3378 | 15 49 4.0 | 15.052 | 9 | 11 31 55.28 | 2.0430 | 2 53 29.7 | 16.553 |
| 10 | 9 49 56.93 | 2.3297 | 15 33 58.5 | 15.130 | 10 | 11 33 57.74 | 2.0391 | 2 36 56.8 | 16.543 |
| 11 | 9 52 16.47 | 2.3216 | 15 18 48.4 | 15.207 | 11 | 11 35 59.97 | 2.0353 | 2 20 24.6 | 16.531 |
| 12 | 9 54 35.52 | 2.3136 | 15 3 33.7 | 15.281 | 12 | 11 38 1.98 | 2.0317 | 2 3 53.1 | 16.518 |
| 13 | 9 56 54.10 | 2.3057 | 14 48 14.7 | 15.352 | 13 | 11 40 3.78 | 2.0282 | 1 47 22.4 | 16.504 |
| 14 | 9 59 12.21 | 2.2979 | 14 32 51.5 | 15.420 | 14 | 11 42 5.37 | 2.0247 | 1 30 52.6 | 16.488 |
| 15 | 10 1 29.85 | 2.2902 | 14 17 24.3 | 15.487 | 15 | 11 44 6.75 | 2.0213 | 1 14 23.8 | 16.471 |
| 16 | 10 3 47.03 | 2.2825 | 14 1 53.1 | 15.552 | 16 | 11 46 7.93 | 2.0181 | 0 57 56.1 | 16.452 |
| 17 | 10 6 3.75 | 2.2748 | 13 46 18.1 | 15.615 | 17 | 11 48 8.92 | 2.0149 | 0 41 29.5 | 16.433 |
| 18 | 10 8 20.01 | 2.2672 | 13 30 39.3 | 15.676 | 18 | 11 50 9.72 | 2.0118 | 0 25 4.1 | 16.412 |
| 19 | 10 10 35.82 | 2.2598 | 13 14 57.0 | 15.733 | 19 | 11 52 10.34 | 2.0088 | N. 0 8 40.0 | 16.390 |
| 20 | 10 12 51.19 | 2.2525 | 12 59 11.3 | 15.789 | 20 | 11 54 10.78 | 2.0059 | S. 0 7 42.7 | 16.367 |
| 21 | 10 15 6.12 | 2.2452 | 12 43 22.3 | 15.843 | 21 | 11 56 11.05 | 2.0031 | 0 24 4.0 | 16.342 |
| 22 | 10 17 20.61 | 2.2379 | 12 27 30.1 | 15.895 | 22 | 11 58 11.15 | 2.0004 | 0 40 23.8 | 16.317 |
| 23 | 10 19 34.67 | 2.2308 | 12 11 34.9 | 15.945 | 23 | 12 0 11.10 | 1.9979 | 0 56 42.0 | 16.290 |
| 24 | 10 21 48.31 | 2.2238 | N.11 55 36.7 | 15.993 | 24 | 12 2 10.90 | 1.9954 | S. 1 12 58.6 | 16.262 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | TUESDAY 25. | | | | | THURSDAY 27. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 12 2 10.90 | 1.9954 | S. 1 12 58.6 | 16.262 | 0 | 13 36 41.96 | 1.9735 | S. 13 21 14.3 | 13.723 |
| 1 | 12 4 10.55 | 1.9929 | 1 29 13.4 | 16.232 | 1 | 13 38 40.41 | 1.9748 | 13 34 55.4 | 13.648 |
| 2 | 12 6 10.05 | 1.9905 | 1 45 26.4 | 16.202 | 2 | 13 40 38.94 | 1.9762 | 13 48 32.1 | 13.573 |
| 3 | 12 8 9.41 | 1.9883 | 2 1 37.6 | 16.171 | 3 | 13 42 37.56 | 1.9777 | 14 2 4.2 | 13.497 |
| 4 | 12 10 8.64 | 1.9862 | 2 17 46.9 | 16.138 | 4 | 13 44 36.27 | 1.9793 | 14 15 31.7 | 13.420 |
| 5 | 12 12 7.75 | 1.9842 | 2 33 54.2 | 16.104 | 5 | 13 46 35.08 | 1.9809 | 14 28 54.6 | 13.342 |
| 6 | 12 14 6.74 | 1.9822 | 2 49 59.4 | 16.068 | 6 | 13 48 33.98 | 1.9825 | 14 42 12.8 | 13.264 |
| 7 | 12 16 5.61 | 1.9802 | 3 6 2.4 | 16.032 | 7 | 13 50 32.98 | 1.9843 | 14 55 26.3 | 13.186 |
| 8 | 12 18 4.37 | 1.9784 | 3 22 3.2 | 15.995 | 8 | 13 52 32.09 | 1.9861 | 15 8 35.1 | 13.107 |
| 9 | 12 20 3.02 | 1.9767 | 3 38 1.8 | 15.957 | 9 | 13 54 31.31 | 1.9879 | 15 21 39.1 | 13.026 |
| 10 | 12 22 1.57 | 1.9751 | 3 53 58.1 | 15.918 | 10 | 13 56 30.64 | 1.9897 | 15 34 38.2 | 12.944 |
| 11 | 12 24 0.03 | 1.9737 | 4 9 52.0 | 15.877 | 11 | 13 58 30.08 | 1.9917 | 15 47 32.4 | 12.862 |
| 12 | 12 25 58.41 | 1.9722 | 4 25 43.4 | 15.836 | 12 | 14 0 29.64 | 1.9937 | 16 0 21.6 | 12.779 |
| 13 | 12 27 56.70 | 1.9708 | 4 41 32.3 | 15.794 | 13 | 14 2 29.32 | 1.9957 | 16 13 5.8 | 12.695 |
| 14 | 12 29 54.91 | 1.9696 | 4 57 18.7 | 15.751 | 14 | 14 4 29.13 | 1.9978 | 16 25 45.0 | 12.611 |
| 15 | 12 31 53.05 | 1.9684 | 5 13 2.4 | 15.706 | 15 | 14 6 29.06 | 1.9999 | 16 38 19.1 | 12.526 |
| 16 | 12 33 51.12 | 1.9673 | 5 28 43.4 | 15.660 | 16 | 14 8 29.12 | 2.0022 | 16 50 48.1 | 12.440 |
| 17 | 12 35 49.12 | 1.9662 | 5 44 21.6 | 15.613 | 17 | 14 10 29.32 | 2.0044 | 17 3 11.9 | 12.353 |
| 18 | 12 37 47.06 | 1.9653 | 5 59 57.0 | 15.566 | 18 | 14 12 29.65 | 2.0067 | 17 15 30.5 | 12.266 |
| 19 | 12 39 44.95 | 1.9645 | 6 15 29.5 | 15.517 | 19 | 14 14 30.12 | 2.0090 | 17 27 43.8 | 12.177 |
| 20 | 12 41 42.80 | 1.9637 | 6 30 59.1 | 15.468 | 20 | 14 16 30.73 | 2.0114 | 17 39 51.8 | 12.088 |
| 21 | 12 43 40.60 | 1.9630 | 6 46 25.7 | 15.418 | 21 | 14 18 31.49 | 2.0138 | 17 51 54.4 | 11.999 |
| 22 | 12 45 38.36 | 1.9624 | 7 1 49.3 | 15.366 | 22 | 14 20 32.39 | 2.0162 | 18 3 51.7 | 11.909 |
| 23 | 12 47 36.09 | 1.9619 | S. 7 17 9.7 | 15.314 | 23 | 14 22 33.44 | 2.0188 | S. 18 15 43.5 | 11.818 |
| | WEDNESDAY 26. | | | | | FRIDAY 28. | | | |
| 0 | 12 49 33.79 | 1.9614 | S. 7 32 27.0 | 15.262 | 0 | 14 24 34.65 | 2.0214 | S. 18 27 29.8 | 11.726 |
| 1 | 12 51 31.46 | 1.9611 | 7 47 41.1 | 15.208 | 1 | 14 26 36.01 | 2.0240 | 18 39 10.6 | 11.633 |
| 2 | 12 53 29.12 | 1.9608 | 8 2 51.9 | 15.152 | 2 | 14 28 37.53 | 2.0266 | 18 50 45.8 | 11.540 |
| 3 | 12 55 26.76 | 1.9606 | 8 17 59.3 | 15.096 | 3 | 14 30 39.20 | 2.0292 | 19 2 15.4 | 11.447 |
| 4 | 12 57 24.39 | 1.9605 | 8 33 3.4 | 15.040 | 4 | 14 32 41.03 | 2.0319 | 19 13 39.4 | 11.352 |
| 5 | 12 59 22.02 | 1.9605 | 8 48 4.1 | 14.982 | 5 | 14 34 43.03 | 2.0347 | 19 24 57.6 | 11.256 |
| 6 | 13 1 19.65 | 1.9605 | 9 3 1.2 | 14.923 | 6 | 14 36 45.20 | 2.0375 | 19 36 10.1 | 11.160 |
| 7 | 13 3 17.28 | 1.9606 | 9 17 54.8 | 14.863 | 7 | 14 38 47.53 | 2.0403 | 19 47 16.8 | 11.063 |
| 8 | 13 5 14.92 | 1.9608 | 9 32 44.8 | 14.803 | 8 | 14 40 50.03 | 2.0431 | 19 58 17.7 | 10.966 |
| 9 | 13 7 12.58 | 1.9611 | 9 47 31.2 | 14.742 | 9 | 14 42 52.70 | 2.0459 | 20 9 12.7 | 10.867 |
| 10 | 13 9 10.25 | 1.9614 | 10 2 13.9 | 14.680 | 10 | 14 44 55.54 | 2.0488 | 20 20 1.8 | 10.768 |
| 11 | 13 11 7.95 | 1.9618 | 10 16 52.8 | 14.617 | 11 | 14 46 58.56 | 2.0517 | 20 30 44.9 | 10.669 |
| 12 | 13 13 5.67 | 1.9622 | 10 31 27.9 | 14.553 | 12 | 14 49 1.75 | 2.0547 | 20 41 22.1 | 10.569 |
| 13 | 13 15 3.42 | 1.9628 | 10 45 59.1 | 14.488 | 13 | 14 51 5.12 | 2.0577 | 20 51 53.2 | 10.468 |
| 14 | 13 17 1.21 | 1.9635 | 11 0 26.5 | 14.423 | 14 | 14 53 8.67 | 2.0606 | 21 2 18.2 | 10.366 |
| 15 | 13 18 59.04 | 1.9642 | 11 14 49.9 | 14.357 | 15 | 14 55 12.39 | 2.0636 | 21 12 37.1 | 10.263 |
| 16 | 13 20 56.91 | 1.9649 | 11 29 9.3 | 14.290 | 16 | 14 57 16.30 | 2.0667 | 21 22 49.8 | 10.160 |
| 17 | 13 22 54.83 | 1.9658 | 11 43 24.7 | 14.222 | 17 | 14 59 20.39 | 2.0697 | 21 32 56.3 | 10.056 |
| 18 | 13 24 52.81 | 1.9667 | 11 57 35.9 | 14.152 | 18 | 15 1 24.67 | 2.0728 | 21 42 56.5 | 9.951 |
| 19 | 13 26 50.84 | 1.9677 | 12 11 42.9 | 14.082 | 19 | 15 3 29.13 | 2.0759 | 21 52 50.4 | 9.846 |
| 20 | 13 28 48.93 | 1.9687 | 12 25 45.8 | 14.012 | 20 | 15 5 33.78 | 2.0790 | 22 2 38.0 | 9.740 |
| 21 | 13 30 47.08 | 1.9697 | 12 39 44.4 | 13.941 | 21 | 15 7 38.61 | 2.0821 | 22 12 19.2 | 9.633 |
| 22 | 13 32 45.30 | 1.9709 | 12 53 38.7 | 13.869 | 22 | 15 9 43.63 | 2.0852 | 22 21 54.0 | 9.526 |
| 23 | 13 34 43.59 | 1.9722 | 13 7 28.7 | 13.797 | 23 | 15 11 48.84 | 2.0883 | 22 31 22.3 | 9.418 |
| 24 | 13 36 41.96 | 1.9735 | S. 13 21 14.3 | 13.723 | 24 | 15 13 54.23 | 2.0914 | S. 22 40 44.1 | 9.309 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION

### SATURDAY 29.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 15 13 54.23 | 2.0914 | S.22 40 44.1 | 9.309 |
| 1 | 15 15 59.81 | 2.0946 | 22 49 59.4 | 9.200 |
| 2 | 15 18 5.58 | 2.0978 | 22 59 8.1 | 9.090 |
| 3 | 15 20 11.55 | 2.1011 | 23 8 10.2 | 8.979 |
| 4 | 15 22 17.71 | 2.1042 | 23 17 5.6 | 8.868 |
| 5 | 15 24 24.05 | 2.1073 | 23 25 54.3 | 8.756 |
| 6 | 15 26 30.58 | 2.1104 | 23 34 36.3 | 8.643 |
| 7 | 15 28 37.30 | 2.1136 | 23 43 11.5 | 8.530 |
| 8 | 15 30 44.21 | 2.1168 | 23 51 39.9 | 8.416 |
| 9 | 15 32 51.32 | 2.1200 | 24 0 1.4 | 8.301 |
| 10 | 15 34 58.61 | 2.1231 | 24 8 16.0 | 8.186 |
| 11 | 15 37 6.09 | 2.1262 | 24 16 23.7 | 8.071 |
| 12 | 15 39 13.75 | 2.1293 | 24 24 24.5 | 7.954 |
| 13 | 15 41 21.60 | 2.1324 | 24 32 18.2 | 7.837 |
| 14 | 15 43 29.64 | 2.1356 | 24 40 4.9 | 7.719 |
| 15 | 15 45 37.87 | 2.1387 | 24 47 44.5 | 7.601 |
| 16 | 15 47 46.28 | 2.1417 | 24 55 17.0 | 7.482 |
| 17 | 15 49 54.88 | 2.1448 | 25 2 42.3 | 7.362 |
| 18 | 15 52 3.66 | 2.1478 | 25 10 0.4 | 7.242 |
| 19 | 15 54 12.62 | 2.1508 | 25 17 11.3 | 7.121 |
| 20 | 15 56 21.76 | 2.1538 | 25 24 14.9 | 6.999 |
| 21 | 15 58 31.08 | 2.1568 | 25 31 11.2 | 6.878 |
| 22 | 16 0 40.58 | 2.1597 | 25 38 0.2 | 6.756 |
| 23 | 16 2 50.25 | 2.1627 | S.25 44 41.9 | 6.633 |

### SUNDAY 30.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 16 5 0.10 | 2.1656 | S.25 51 16.2 | 6.509 |
| 1 | 16 7 10.12 | 2.1684 | 25 57 43.0 | 6.384 |
| 2 | 16 9 20.31 | 2.1713 | 26 4 2.3 | 6.259 |
| 3 | 16 11 30.67 | 2.1741 | 26 10 14.1 | 6.134 |
| 4 | 16 13 41.20 | 2.1768 | 26 16 18.4 | 6.009 |
| 5 | 16 15 51.89 | 2.1796 | 26 22 15.2 | 5.883 |
| 6 | 16 18 2.75 | 2.1823 | 26 28 4.4 | 5.756 |
| 7 | 16 20 13.77 | 2.1849 | 26 33 45.9 | 5.629 |
| 8 | 16 22 24.94 | 2.1875 | 26 39 19.8 | 5.501 |
| 9 | 16 24 36.27 | 2.1901 | 26 44 46.0 | 5.372 |
| 10 | 16 26 47.75 | 2.1926 | 26 50 4.5 | 5.243 |
| 11 | 16 28 59.38 | 2.1951 | 26 55 15.2 | 5.114 |
| 12 | 16 31 11.16 | 2.1976 | 27 0 18.2 | 4.985 |
| 13 | 16 33 23.09 | 2.1999 | 27 5 13.4 | 4.854 |
| 14 | 16 35 35.15 | 2.2022 | 27 10 0.7 | 4.723 |
| 15 | 16 37 47.35 | 2.2045 | 27 14 40.2 | 4.593 |
| 16 | 16 39 59.69 | 2.2067 | 27 19 11.8 | 4.462 |
| 17 | 16 42 12.16 | 2.2088 | 27 23 35.6 | 4.330 |
| 18 | 16 44 24.75 | 2.2109 | 27 27 51.4 | 4.197 |
| 19 | 16 46 37.47 | 2.2130 | 27 31 59.2 | 4.064 |
| 20 | 16 48 50.31 | 2.2150 | 27 35 59.1 | 3.932 |
| 21 | 16 51 3.27 | 2.2170 | 27 39 51.0 | 3.796 |
| 22 | 16 53 16.35 | 2.2189 | 27 43 34.9 | 3.664 |
| 23 | 16 55 29.54 | 2.2207 | 27 47 10.7 | 3.529 |
| 24 | 16 57 42.83 | 2.2224 | S.27 50 38.4 | 3.394 |

### MONDAY 31.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 16 57 42.83 | 2.2224 | S.27 50 38.4 | 3.394 |
| 1 | 16 59 56.23 | 2.2242 | 27 53 58.0 | 3.260 |
| 2 | 17 2 9.73 | 2.2258 | 27 57 9.6 | 3.126 |
| 3 | 17 4 23.32 | 2.2273 | 28 0 13.1 | 2.990 |
| 4 | 17 6 37.00 | 2.2288 | 28 3 8.4 | 2.854 |
| 5 | 17 8 50.77 | 2.2303 | 28 5 55.6 | 2.718 |
| 6 | 17 11 4.63 | 2.2316 | 28 8 34.6 | 2.583 |
| 7 | 17 13 18.56 | 2.2328 | 28 11 5.5 | 2.447 |
| 8 | 17 15 32.57 | 2.2341 | 28 13 28.2 | 2.310 |
| 9 | 17 17 46.65 | 2.2353 | 28 15 42.7 | 2.172 |
| 10 | 17 20 0.80 | 2.2363 | 28 17 48.9 | 2.035 |
| 11 | 17 22 15.01 | 2.2373 | 28 19 46.9 | 1.898 |
| 12 | 17 24 29.27 | 2.2382 | 28 21 36.7 | 1.761 |
| 13 | 17 26 43.59 | 2.2391 | 28 23 18.2 | 1.624 |
| 14 | 17 28 57.96 | 2.2398 | 28 24 51.5 | 1.486 |
| 15 | 17 31 12.37 | 2.2405 | 28 26 16.5 | 1.347 |
| 16 | 17 33 26.82 | 2.2411 | 28 27 33.2 | 1.209 |
| 17 | 17 35 41.30 | 2.2417 | 28 28 41.6 | 1.072 |
| 18 | 17 37 55.82 | 2.2422 | 28 29 41.8 | 0.934 |
| 19 | 17 40 10.36 | 2.2425 | 28 30 33.7 | 0.795 |
| 20 | 17 42 24.92 | 2.2428 | 28 31 17.2 | 0.656 |
| 21 | 17 44 39.50 | 2.2431 | 28 31 52.4 | 0.517 |
| 22 | 17 46 54.09 | 2.2433 | 28 32 19.3 | 0.379 |
| 23 | 17 49 8.68 | 2.2433 | S.28 32 37.9 | 0.242 |

### TUESDAY, AUGUST 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 17 51 23.27 | 2.2433 | S.28 32 48.3 | 0.103 |

## PHASES OF THE MOON.

| | d | h | m |
|---|---|---|---|
| ○ Full Moon,. . . | 6 | 3 | 37.9 |
| ☾ Last Quarter, . . | 14 | 1 | 55.8 |
| ● New Moon, . . | 20 | 16 | 52.9 |
| ☽ First Quarter,. . | 27 | 15 | 18.9 |

| | d | h |
|---|---|---|
| ☾ Apogee,. . . . . | 5 | 12.0 |
| ☾ Perigee,. . . . . | 20 | 1.0 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P.L. of Diff. | IIIh. | P.L. of Diff. | VIh. | P.L. of Diff. | IXh. | P.L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SUN | W. | 123° 10′ 32″ | 3316 | 124° 34′ 25″ | 3325 | 125° 58′ 7″ | 3335 | 127° 21′ 38″ | 3345 |
| | Regulus | W. | 75 7 53 | 2942 | 76 39 19 | 2950 | 78 10 35 | 2958 | 79 41 40 | 2965 |
| | Spica | W. | 21 6 9 | 2940 | 22 37 37 | 2949 | 24 8 54 | 2957 | 25 40 1 | 2964 |
| | Antares | E. | 24 48 42 | 2940 | 23 17 14 | 2948 | 21 45 56 | 2956 | 20 14 48 | 2964 |
| | α Aquilæ | E. | 80 31 11 | 3747 | 79 15 14 | 3765 | 77 59 35 | 3782 | 76 44 14 | 3799 |
| | Saturn | E. | 114 34 25 | 2931 | 113 2 46 | 2940 | 111 31 18 | 2948 | 110 0 0 | 2956 |
| 2 | SUN | W. | 134 16 37 | 3387 | 135 39 8 | 3395 | 137 1 30 | 3403 | 138 23 43 | 3410 |
| | Regulus | W. | 87 14 49 | 3000 | 88 45 2 | 3006 | 90 15 7 | 3012 | 91 45 5 | 3017 |
| | Spica | W. | 33 13 19 | 2998 | 34 43 34 | 3005 | 36 13 41 | 3010 | 37 43 41 | 3015 |
| | α Aquilæ | E. | 70 32 27 | 3905 | 69 19 12 | 3928 | 68 6 21 | 3954 | 66 53 56 | 3980 |
| | Fomalhaut | E. | 94 43 25 | 3250 | 93 18 15 | 3255 | 91 53 11 | 3260 | 90 28 13 | 3265 |
| | Saturn | E. | 102 25 49 | 2990 | 100 55 24 | 2996 | 99 25 6 | 3001 | 97 54 55 | 3006 |
| 3 | Regulus | W. | 99 13 23 | 3040 | 100 42 46 | 3043 | 102 12 5 | 3047 | 103 41 19 | 3051 |
| | Spica | W. | 45 12 9 | 3039 | 46 41 34 | 3042 | 48 10 55 | 3046 | 49 40 11 | 3049 |
| | α Aquilæ | E. | 60 58 57 | 4139 | 59 49 33 | 4178 | 58 40 46 | 4218 | 57 32 37 | 4261 |
| | Fomalhaut | E. | 83 24 57 | 3293 | 82 0 37 | 3299 | 80 36 24 | 3305 | 79 12 18 | 3310 |
| | Saturn | E. | 90 25 30 | 3029 | 88 55 53 | 3033 | 87 26 21 | 3036 | 85 56 53 | 3039 |
| | α Pegasi | E. | 105 12 49 | 3311 | 103 48 50 | 3311 | 102 24 51 | 3312 | 101 0 53 | 3313 |
| 4 | Spica | W. | 57 5 38 | 3061 | 58 34 35 | 3064 | 60 3 29 | 3065 | 61 32 21 | 3067 |
| | Jupiter | W. | 27 25 17 | 3129 | 28 52 51 | 3124 | 30 20 31 | 3120 | 31 48 16 | 3115 |
| | Antares | W. | 11 11 17 | 3064 | 12 40 11 | 3065 | 14 9 4 | 3066 | 15 37 55 | 3067 |
| | α Aquilæ | E. | 52 2 45 | 4526 | 50 59 16 | 4592 | 49 56 44 | 4663 | 48 55 13 | 4740 |
| | Fomalhaut | E. | 72 13 31 | 3342 | 70 50 8 | 3350 | 69 26 54 | 3357 | 68 3 48 | 3365 |
| | Saturn | E. | 78 30 27 | 3052 | 77 1 18 | 3054 | 75 32 12 | 3056 | 74 3 8 | 2056 |
| | α Pegasi | E. | 94 1 16 | 3317 | 92 37 24 | 3318 | 91 13 33 | 3319 | 89 49 44 | 3320 |
| 5 | Spica | W. | 68 56 19 | 3071 | 70 25 4 | 3072 | 71 53 48 | 3072 | 73 22 32 | 3071 |
| | Jupiter | W. | 39 8 8 | 3101 | 40 36 16 | 3099 | 42 4 27 | 3097 | 43 32 40 | 3095 |
| | Antares | W. | 23 1 51 | 3071 | 24 30 36 | 3072 | 25 59 20 | 3072 | 27 28 4 | 3072 |
| | α Aquilæ | E. | 44 5 16 | 5235 | 43 11 21 | 5364 | 42 19 0 | 5504 | 41 28 19 | 5660 |
| | Fomalhaut | E. | 61 10 39 | 3409 | 59 48 33 | 3421 | 58 26 40 | 3431 | 57 4 59 | 3444 |
| | Saturn | E. | 66 38 7 | 3060 | 65 9 9 | 3061 | 63 40 12 | 3061 | 62 11 15 | 3061 |
| | α Pegasi | E. | 82 51 5 | 3330 | 81 27 28 | 3332 | 80 3 54 | 3334 | 78 40 22 | 3338 |
| 6 | Spica | W. | 80 46 19 | 3069 | 82 15 7 | 3068 | 83 43 56 | 3066 | 85 12 47 | 3065 |
| | Jupiter | W. | 50 54 23 | 3085 | 52 22 51 | 3082 | 53 51 22 | 3080 | 55 19 56 | 3078 |
| | Antares | W. | 34 51 50 | 3069 | 36 20 38 | 3068 | 37 49 27 | 3066 | 39 18 18 | 3065 |
| | Fomalhaut | E. | 50 20 24 | 3521 | 49 0 23 | 3542 | 47 40 45 | 3563 | 46 21 30 | 3587 |
| | Saturn | E. | 54 46 23 | 3058 | 53 17 22 | 3056 | 51 48 19 | 3055 | 50 19 14 | 3054 |
| | α Pegasi | E. | 71 43 35 | 3354 | 70 20 26 | 3358 | 68 57 21 | 3362 | 67 34 21 | 3367 |
| | α Arietis | E. | 113 20 48 | 3101 | 111 52 40 | 3100 | 110 24 30 | 3097 | 108 56 17 | 3096 |
| 7 | Spica | W. | 92 37 33 | 3055 | 94 6 38 | 3052 | 95 35 46 | 3050 | 97 4 57 | 3047 |
| | Jupiter | W. | 62 43 28 | 3065 | 64 12 20 | 3062 | 65 41 16 | 3059 | 67 10 16 | 3056 |
| | Antares | W. | 46 43 4 | 3055 | 48 12 9 | 3052 | 49 41 17 | 3050 | 51 10 28 | 3047 |
| | Fomalhaut | E. | 39 52 40 | 3749 | 38 36 45 | 3793 | 37 21 36 | 3844 | 36 7 19 | 3900 |
| | Saturn | E. | 42 53 20 | 3044 | 41 24 2 | 3041 | 39 54 40 | 3039 | 38 25 15 | 3035 |
| | α Pegasi | E. | 60 40 57 | 3399 | 59 18 39 | 3407 | 57 56 30 | 3416 | 56 34 32 | 3426 |
| | α Arietis | E. | 101 34 34 | 3083 | 100 6 4 | 3081 | 98 37 31 | 3078 | 97 8 54 | 3074 |
| 8 | Spica | W. | 104 31 51 | 3030 | 106 1 27 | 3026 | 107 31 7 | 3022 | 109 0 53 | 3018 |
| | Jupiter | W. | 74 36 16 | 3038 | 76 5 42 | 3034 | 77 35 13 | 3030 | 79 4 49 | 3026 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | |
| 1 | Sun | W. | 128 44 58 | 3353 | 130 8 8 | 3363 | 131 31 7 | 3371 | 132 53 57 | 3379 |
| | Regulus | W. | 81 12 36 | 2973 | 82 43 22 | 2980 | 84 14 0 | 2987 | 85 44 29 | 2994 |
| | Spica | W. | 27 10 59 | 2972 | 28 41 47 | 2979 | 30 12 26 | 2985 | 31 42 57 | 2993 |
| | Antares | E. | 18 43 50 | 2973 | 17 13 3 | 2980 | 15 42 25 | 2986 | 14 11 55 | 2993 |
| | α Aquilæ | E. | 75 29 11 | 3819 | 74 14 28 | 3839 | 73 0 6 | 3859 | 71 46 5 | 3882 |
| | Saturn | E. | 108 28 52 | 2963 | 106 57 53 | 2970 | 105 27 3 | 2977 | 103 56 22 | 2984 |
| 2 | Sun | W. | 139 45 48 | 3418 | 141 7 44 | 3425 | 142 29 32 | 3432 | 143 51 12 | 3440 |
| | Regulus | W. | 93 14 57 | 3022 | 94 44 42 | 3027 | 96 14 21 | 3031 | 97 43 55 | 3036 |
| | Spica | W. | 39 13 35 | 3021 | 40 43 22 | 3026 | 42 13 3 | 3030 | 43 42 39 | 3034 |
| | α Aquilæ | E. | 65 41 57 | 4009 | 64 30 26 | 4039 | 63 19 25 | 4071 | 62 8 55 | 4104 |
| | Fomalhaut | E. | 89 3 21 | 3270 | 87 38 35 | 3276 | 86 13 56 | 3282 | 84 49 23 | 3288 |
| | Saturn | E. | 96 24 50 | 3011 | 94 54 51 | 3017 | 93 24 59 | 3021 | 91 55 12 | 3025 |
| 3 | Regulus | W. | 105 10 29 | 3054 | 106 39 35 | 3056 | 108 8 38 | 3059 | 109 37 38 | 3061 |
| | Spica | W. | 51 9 23 | 3052 | 52 38 32 | 3055 | 54 7 37 | 3057 | 55 36 39 | 3060 |
| | α Aquilæ | E. | 56 25 8 | 4307 | 55 18 22 | 4356 | 54 12 21 | 4409 | 53 7 8 | 4465 |
| | Fomalhaut | E. | 77 48 18 | 3316 | 76 24 25 | 3323 | 75 0 40 | 3329 | 73 37 2 | 3335 |
| | Saturn | E. | 84 27 29 | 3043 | 82 58 9 | 3045 | 81 28 52 | 3047 | 79 59 38 | 3050 |
| | α Pegasi | E. | 99 36 56 | 3313 | 98 13 0 | 3313 | 96 49 4 | 3314 | 95 25 9 | 3316 |
| 4 | Spica | W. | 63 1 11 | 3068 | 64 30 0 | 3069 | 65 58 47 | 3070 | 67 27 33 | 3070 |
| | Jupiter | W. | 33 16 7 | 3112 | 34 44 2 | 3109 | 36 12 1 | 3106 | 37 40 3 | 3104 |
| | Antares | W. | 17 6 45 | 3069 | 18 35 33 | 3069 | 20 4 20 | 3070 | 21 33 6 | 3071 |
| | α Aquilæ | E. | 47 54 47 | 4822 | 46 55 29 | 4913 | 45 57 25 | 5012 | 45 0 39 | 5119 |
| | Fomalhaut | E. | 66 40 51 | 3372 | 65 18 3 | 3381 | 63 55 25 | 3390 | 62 32 57 | 3399 |
| | Saturn | E. | 72 34 5 | 3058 | 71 5 4 | 3059 | 69 36 4 | 3060 | 68 7 5 | 3060 |
| | α Pegasi | E. | 88 25 56 | 3322 | 87 2 10 | 3324 | 85 38 26 | 3325 | 84 14 44 | 3328 |
| 5 | Spica | W. | 74 51 17 | 3071 | 76 20 2 | 3071 | 77 48 47 | 3070 | 79 17 33 | 3070 |
| | Jupiter | W. | 45 0 56 | 3093 | 46 29 14 | 3091 | 47 57 35 | 3089 | 49 25 58 | 3087 |
| | Antares | W. | 28 56 48 | 3072 | 30 25 32 | 3071 | 31 54 17 | 3070 | 33 23 3 | 3069 |
| | α Aquilæ | E. | 40 39 25 | 5830 | 39 52 24 | 6017 | 39 7 22 | 6226 | 38 24 27 | 6459 |
| | Fomalhaut | E. | 55 43 32 | 3457 | 54 22 20 | 3471 | 53 1 24 | 3487 | 51 40 45 | 3503 |
| | Saturn | E. | 60 42 18 | 3060 | 59 13 20 | 3060 | 57 44 22 | 3060 | 56 15 23 | 3059 |
| | α Pegasi | E. | 77 16 54 | 3340 | 75 53 29 | 3343 | 74 30 7 | 3346 | 73 6 49 | 3350 |
| 6 | Spica | W. | 86 41 40 | 3063 | 88 10 35 | 3061 | 89 39 32 | 3060 | 91 8 31 | 3057 |
| | Jupiter | W. | 56 48 32 | 3076 | 58 17 11 | 3073 | 59 45 53 | 3070 | 61 14 39 | 3068 |
| | Antares | W. | 40 47 11 | 3063 | 42 16 6 | 3061 | 43 45 3 | 3060 | 45 14 2 | 3057 |
| | Fomalhaut | E. | 45 2 41 | 3613 | 43 44 21 | 3642 | 42 26 32 | 3674 | 41 9 17 | 3709 |
| | Saturn | E. | 48 50 8 | 3052 | 47 21 0 | 3050 | 45 51 49 | 3048 | 44 22 36 | 3046 |
| | α Pegasi | E. | 66 11 27 | 3372 | 64 48 39 | 3379 | 63 25 58 | 3385 | 62 3 24 | 3391 |
| | α Arietis | E. | 107 28 2 | 3093 | 105 59 44 | 3091 | 104 31 24 | 3089 | 103 3 1 | 3086 |
| 7 | Spica | W. | 98 34 12 | 3044 | 100 3 30 | 3040 | 101 32 53 | 3037 | 103 2 20 | 3034 |
| | Jupiter | W. | 68 39 19 | 3052 | 70 8 27 | 3049 | 71 37 35 | 3046 | 73 6 55 | 3042 |
| | Antares | W. | 52 39 43 | 3043 | 54 9 2 | 3041 | 55 38 24 | 3038 | 57 7 50 | 3034 |
| | Fomalhaut | E. | 34 53 59 | 3963 | 33 41 43 | 4036 | 32 30 39 | 4117 | 31 20 54 | 4213 |
| | Saturn | E. | 36 55 46 | 3033 | 35 26 14 | 3029 | 33 56 37 | 3026 | 32 26 56 | 3022 |
| | α Pegasi | E. | 55 12 45 | 3437 | 53 51 10 | 3448 | 52 29 48 | 3462 | 51 8 41 | 3477 |
| | α Arietis | E. | 95 40 13 | 3072 | 94 11 29 | 3068 | 92 42 40 | 3065 | 91 13 47 | 3061 |
| 8 | Spica | W. | 110 30 44 | 3013 | 112 0 41 | 3008 | 113 30 44 | 3003 | 115 0 53 | 2998 |
| | Jupiter | W | 80 34 30 | 3021 | 82 4 17 | 3016 | 83 34 10 | 3011 | 85 4 9 | 3005 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Antares | W. | 58° 37′ 21″ | 3030 | 60° 6′ 56″ | 3026 | 61° 36′ 37″ | 3022 | 63° 6′ 23″ | 3018 |
| | Fomalhaut | E. | 30 12 40 | 4321 | 29 6 7 | 4446 | 28 1 27 | 4592 | 26 58 55 | 4760 |
| | Saturn | E. | 30 57 11 | 3018 | 29 27 21 | 3014 | 27 57 26 | 3010 | 26 27 26 | 3006 |
| | α Pegasi | E. | 49 47 51 | 3493 | 48 27 19 | 3510 | 47 7 6 | 3530 | 45 47 15 | 3552 |
| | α Arietis | E. | 89 44 50 | 3057 | 88 15 48 | 3053 | 86 46 41 | 3049 | 85 17 29 | 3045 |
| | Aldebaran | E. | 120 36 53 | 3125 | 119 9 14 | 3119 | 117 41 28 | 3113 | 116 13 34 | 3106 |
| 9 | Jupiter | W. | 86 34 15 | 3001 | 88 4 27 | 2995 | 89 34 46 | 2989 | 91 5 12 | 2983 |
| | Antares | W. | 70 36 38 | 2992 | 72 7 1 | 2986 | 73 37 31 | 2981 | 75 8 8 | 2975 |
| | α Aquilæ | W. | 36 45 38 | 6797 | 37 23 16 | 6509 | 38 3 29 | 6250 | 38 46 10 | 6019 |
| | α Pegasi | E. | 39 15 6 | 3710 | 37 58 30 | 3755 | 36 42 41 | 3805 | 35 27 44 | 3863 |
| | α Arietis | E. | 77 50 7 | 3022 | 76 20 21 | 3016 | 74 50 28 | 3010 | 73 20 28 | 3005 |
| | Aldebaran | E. | 108 51 59 | 3072 | 107 23 15 | 3065 | 105 54 23 | 3058 | 104 25 22 | 3051 |
| 10 | Jupiter | W. | 98 39 19 | 2951 | 100 10 23 | 2943 | 101 41 57 | 2936 | 103 13 30 | 2928 |
| | Antares | W. | 82 43 11 | 2941 | 84 14 38 | 2934 | 85 46 14 | 2926 | 87 18 0 | 2917 |
| | α Aquilæ | W. | 42 52 22 | 5148 | 43 47 23 | 5017 | 44 44 5 | 4895 | 45 42 24 | 4785 |
| | α Arietis | E. | 65 48 39 | 2974 | 64 17 54 | 2967 | 62 47 0 | 2961 | 61 15 58 | 2954 |
| | Aldebaran | E. | 96 58 3 | 3014 | 95 28 7 | 3006 | 93 58 2 | 2998 | 92 27 47 | 2989 |
| | Sun | E. | 137 34 35 | 3325 | 136 10 53 | 3316 | 134 47 0 | 3306 | 133 22 55 | 3296 |
| 11 | Jupiter | W. | 110 53 47 | 2887 | 112 26 23 | 2878 | 113 59 10 | 2869 | 115 32 9 | 2859 |
| | Antares | W. | 94 59 33 | 2873 | 96 32 26 | 2863 | 98 5 32 | 2853 | 99 38 51 | 2844 |
| | α Aquilæ | W. | 50 55 4 | 4340 | 52 1 20 | 4268 | 53 8 42 | 4202 | 54 17 6 | 4139 |
| | α Arietis | E. | 53 38 29 | 2916 | 52 6 30 | 2908 | 50 34 21 | 2900 | 49 2 2 | 2892 |
| | Aldebaran | E. | 84 53 51 | 2946 | 83 22 30 | 2937 | 81 50 58 | 2927 | 80 19 14 | 2918 |
| | Sun | E. | 126 19 33 | 3243 | 124 54 15 | 3231 | 123 28 43 | 3220 | 122 2 58 | 3209 |
| 12 | Antares | W. | 107 28 48 | 2788 | 109 3 32 | 2776 | 110 38 31 | 2764 | 112 13 46 | 2751 |
| | α Aquilæ | W. | 60 13 8 | 3876 | 61 26 52 | 3832 | 62 41 21 | 3790 | 63 56 34 | 3750 |
| | Saturn | W. | 18 3 30 | 2775 | 19 38 30 | 2764 | 21 13 45 | 2751 | 22 49 17 | 2739 |
| | α Arietis | E. | 41 17 57 | 2852 | 39 44 37 | 2845 | 38 11 7 | 2838 | 36 37 28 | 2831 |
| | Aldebaran | E. | 72 37 29 | 2868 | 71 4 29 | 2858 | 69 31 16 | 2847 | 67 57 49 | 2837 |
| | Sun | E. | 114 50 36 | 3146 | 113 23 22 | 3133 | 111 55 52 | 3119 | 110 28 5 | 3105 |
| 13 | α Aquilæ | W. | 70 22 35 | 3575 | 71 41 37 | 3545 | 73 1 12 | 3515 | 74 21 20 | 3487 |
| | Fomalhaut | W. | 41 55 47 | 3278 | 43 20 24 | 3230 | 44 45 58 | 3184 | 46 12 26 | 3141 |
| | Saturn | W. | 30 51 12 | 2672 | 32 28 29 | 2657 | 34 6 6 | 2643 | 35 44 2 | 2629 |
| | α Pegasi | W. | 24 8 40 | 4849 | 25 7 36 | 4579 | 26 10 19 | 4351 | 27 16 25 | 4157 |
| | Aldebaran | E. | 60 7 9 | 2783 | 58 32 19 | 2772 | 56 57 15 | 2763 | 55 21 58 | 2752 |
| | Sun | E. | 103 4 54 | 3032 | 101 35 21 | 3017 | 100 5 29 | 3001 | 98 35 17 | 2985 |
| 14 | α Aquilæ | W. | 81 9 26 | 3362 | 82 32 26 | 3340 | 83 55 51 | 3320 | 85 19 39 | 3300 |
| | Fomalhaut | W. | 53 36 49 | 2960 | 55 7 52 | 2929 | 56 39 34 | 2898 | 58 11 55 | 2870 |
| | Saturn | W. | 43 58 44 | 2553 | 45 38 44 | 2538 | 47 19 5 | 2522 | 48 59 48 | 2505 |
| | α Pegasi | W. | 33 26 58 | 3496 | 34 47 27 | 3405 | 36 9 38 | 3323 | 37 33 23 | 3249 |
| | Aldebaran | E. | 47 22 16 | 2706 | 45 45 44 | 2698 | 44 9 1 | 2691 | 42 32 9 | 2686 |
| | Sun | E. | 90 59 17 | 2903 | 89 27 2 | 2886 | 87 54 25 | 2869 | 86 21 27 | 2852 |
| 15 | α Aquilæ | W. | 92 24 4 | 3216 | 93 49 54 | 3203 | 95 16 0 | 3191 | 96 42 20 | 3179 |
| | Fomalhaut | W. | 66 2 33 | 2738 | 67 38 22 | 2715 | 69 14 42 | 2692 | 70 51 33 | 2669 |
| | Saturn | W. | 57 29 5 | 2424 | 59 12 6 | 2407 | 60 55 31 | 2390 | 62 39 20 | 2374 |
| | α Pegasi | W. | 44 51 47 | 2961 | 46 22 49 | 2915 | 47 54 49 | 2873 | 49 27 43 | 2832 |
| | Aldebaran | E. | 34 26 38 | 2682 | 32 49 34 | 2689 | 31 12 40 | 2701 | 29 36 1 | 2718 |
| | Sun | E. | 78 30 56 | 2764 | 76 55 41 | 2746 | 75 20 2 | 2729 | 73 44 0 | 2711 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Antares | W. | 64° 36′ 14″ | 3013 | 66° 6′ 11″ | 3008 | 67° 36′ 14″ | 3003 | 69° 6′ 23″ | 2998 |
| | Fomalhaut | E. | 25 58 46 | 4960 | 25 1 19 | 5197 | 24 6 55 | 5477 | 23 15 55 | 5812 |
| | Saturn | E. | 24 57 21 | 3001 | 23 27 10 | 2997 | 21 56 53 | 2992 | 20 26 30 | 2987 |
| | α Pegasi | E. | 44 27 48 | 3576 | 43 8 48 | 3605 | 41 50 19 | 3636 | 40 32 24 | 3671 |
| | α Arietis | E. | 83 48 12 | 3040 | 82 18 49 | 3036 | 80 49 21 | 3031 | 79 19 47 | 3026 |
| | Aldebaran | E. | 114 45 31 | 3100 | 113 17 21 | 3092 | 111 49 2 | 3086 | 110 20 35 | 3078 |
| 9 | Jupiter | W. | 92 35 46 | 2977 | 94 6 27 | 2971 | 95 37 16 | 2965 | 97 8 13 | 2958 |
| | Antares | W. | 76 38 52 | 2969 | 78 9 44 | 2962 | 79 40 44 | 2955 | 81 11 53 | 2948 |
| | α Aquilæ | W. | 39 31 11 | 5809 | 40 18 26 | 5620 | 41 7 47 | 5447 | 41 59 8 | 5291 |
| | α Pegasi | E. | 34 13 47 | 3928 | 33 0 56 | 4003 | 31 49 19 | 4089 | 30 39 7 | 4188 |
| | α Arietis | E. | 71 50 21 | 2999 | 70 20 7 | 2993 | 68 49 45 | 2987 | 67 19 16 | 2981 |
| | Aldebaran | E. | 102 56 12 | 3044 | 101 26 54 | 3036 | 99 57 26 | 3029 | 98 27 49 | 3022 |
| 10 | Jupiter | W. | 104 45 13 | 2920 | 106 17 6 | 2912 | 107 49 9 | 2904 | 109 21 23 | 2896 |
| | Antares | W. | 88 49 57 | 2909 | 90 22 4 | 2901 | 91 54 22 | 2891 | 93 26 52 | 2883 |
| | α Aquilæ | W. | 46 42 13 | 4682 | 47 43 28 | 4587 | 48 46 4 | 4499 | 49 49 57 | 4416 |
| | α Arietis | E. | 59 44 47 | 2946 | 58 13 27 | 2939 | 56 41 57 | 2931 | 55 10 18 | 2924 |
| | Aldebaran | E. | 90 57 21 | 2981 | 89 26 45 | 2973 | 87 55 58 | 2964 | 86 25 0 | 2955 |
| | Sun | E. | 131 58 39 | 3286 | 130 34 11 | 3276 | 129 9 31 | 3265 | 127 44 38 | 3254 |
| 11 | Jupiter | W. | 117 5 21 | 2849 | 118 38 45 | 2839 | 120 12 22 | 2829 | 121 46 12 | 2819 |
| | Antares | W. | 101 12 22 | 2833 | 102 46 7 | 2822 | 104 20 6 | 2811 | 105 54 20 | 2800 |
| | α Aquilæ | W. | 55 26 30 | 4081 | 56 36 50 | 4025 | 57 48 5 | 3972 | 59 0 12 | 3923 |
| | α Arietis | E. | 47 29 33 | 2884 | 45 56 54 | 2877 | 44 24 6 | 2869 | 42 51 7 | 2860 |
| | Aldebaran | E. | 78 47 18 | 2909 | 77 15 10 | 2898 | 75 42 49 | 2889 | 74 10 16 | 2878 |
| | Sun | E. | 120 36 59 | 3196 | 119 10 45 | 3184 | 117 44 17 | 3172 | 116 17 34 | 3159 |
| 12 | Antares | W. | 113 49 18 | 2738 | 115 25 7 | 2725 | 117 1 13 | 2712 | 118 37 37 | 2699 |
| | α Aquilæ | W. | 65 12 28 | 3711 | 66 29 3 | 3675 | 67 46 17 | 3640 | 69 4 8 | 3607 |
| | Saturn | W. | 24 25 5 | 2726 | 26 1 10 | 2713 | 27 37 33 | 2700 | 29 14 13 | 2686 |
| | α Arietis | E. | 35 3 40 | 2825 | 33 29 45 | 2820 | 31 55 43 | 2816 | 30 21 36 | 2811 |
| | Aldebaran | E. | 66 24 9 | 2826 | 64 50 15 | 2815 | 63 16 7 | 2805 | 61 41 45 | 2794 |
| | Sun | E. | 109 0 2 | 3091 | 107 31 42 | 3077 | 106 3 4 | 3062 | 104 34 8 | 3047 |
| 13 | α Aquilæ | W. | 75 41 59 | 3460 | 77 3 8 | 3434 | 78 24 46 | 3409 | 79 46 52 | 3385 |
| | Fomalhaut | W. | 47 39 46 | 3101 | 49 7 54 | 3063 | 50 36 49 | 3027 | 52 6 28 | 2993 |
| | Saturn | W. | 37 22 17 | 2614 | 39 0 53 | 2599 | 40 39 49 | 2584 | 42 19 6 | 2569 |
| | α Pegasi | W. | 28 25 32 | 3987 | 29 37 24 | 3840 | 30 51 45 | 3711 | 32 8 20 | 3597 |
| | Aldebaran | E. | 53 46 27 | 2742 | 52 10 43 | 2732 | 50 34 46 | 2723 | 48 58 37 | 2714 |
| | Sun | E. | 97 4 46 | 2969 | 95 33 55 | 2953 | 94 2 43 | 2937 | 92 31 11 | 2920 |
| 14 | α Aquilæ | W. | 86 43 50 | 3281 | 88 8 24 | 3264 | 89 33 18 | 3247 | 90 58 32 | 3231 |
| | Fomalhaut | W. | 59 44 52 | 2842 | 61 18 25 | 2815 | 62 52 34 | 2788 | 64 27 17 | 2763 |
| | Saturn | W. | 50 40 54 | 2489 | 52 22 22 | 2473 | 54 4 13 | 2457 | 55 46 27 | 2440 |
| | α Pegasi | W. | 38 58 34 | 3182 | 40 25 5 | 3119 | 41 52 51 | 3063 | 43 21 46 | 3009 |
| | Aldebaran | E. | 40 55 10 | 2681 | 39 18 5 | 2678 | 37 40 56 | 2678 | 36 3 46 | 2679 |
| | Sun | E. | 84 48 6 | 2835 | 83 14 23 | 2817 | 81 40 17 | 2799 | 80 5 48 | 2782 |
| 15 | α Aquilæ | W. | 98 8 54 | 3169 | 99 35 40 | 3162 | 101 2 35 | 3155 | 102 29 38 | 3149 |
| | Fomalhaut | W. | 72 28 55 | 2646 | 74 6 47 | 2626 | 75 45 7 | 2605 | 77 23 55 | 2585 |
| | Saturn | W. | 64 23 32 | 2357 | 66 8 9 | 2341 | 67 53 9 | 2324 | 69 38 33 | 2307 |
| | α Pegasi | W. | 51 1 29 | 2795 | 52 36 4 | 2758 | 54 11 27 | 2724 | 55 47 35 | 2692 |
| | Aldebaran | E. | 27 59 45 | 2741 | 26 23 59 | 2773 | 24 48 56 | 2816 | 23 14 49 | 2873 |
| | Sun | E. | 72 7 35 | 2693 | 70 30 46 | 2675 | 68 53 33 | 2658 | 67 15 57 | 2640 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 16 | Fomalhaut | W. | 79° 3′ 11″ | 2565 | 80° 42′ 54″ | 2547 | 82° 23′ 2″ | 2528 | 84° 3′ 36″ | 2511 |
| | Saturn | W. | 71 24 22 | 2291 | 73 10 35 | 2275 | 74 57 11 | 2259 | 76 44 11 | 2243 |
| | α Pegasi | W. | 57 24 26 | 2661 | 59 1 58 | 2632 | 60 40 10 | 2604 | 62 19 0 | 2577 |
| | Sun | E. | 65 37 57 | 2624 | 63 59 34 | 2606 | 62 20 47 | 2589 | 60 41 37 | 2573 |
| 17 | Fomalhaut | W. | 92 32 14 | 2433 | 94 15 1 | 2420 | 95 58 7 | 2408 | 97 41 30 | 2397 |
| | Saturn | W. | 85 45 2 | 2167 | 87 34 20 | 2153 | 89 23 59 | 2138 | 91 14 0 | 2125 |
| | α Pegasi | W. | 70 41 46 | 2462 | 72 23 53 | 2441 | 74 6 29 | 2423 | 75 49 31 | 2405 |
| | α Arietis | W. | 27 17 57 | 2304 | 29 3 51 | 2277 | 30 50 25 | 2251 | 32 37 36 | 2228 |
| | Sun | E. | 52 20 13 | 2494 | 50 38 52 | 2480 | 48 57 10 | 2466 | 47 15 9 | 2453 |
| 18 | Saturn | W. | 100 29 1 | 2063 | 102 20 57 | 2053 | 104 13 9 | 2042 | 106 5 37 | 2032 |
| | α Pegasi | W. | 84 30 41 | 2330 | 86 15 57 | 2318 | 88 1 30 | 2307 | 89 47 19 | 2298 |
| | α Arietis | W. | 41 41 21 | 2136 | 43 31 25 | 2122 | 45 21 51 | 2108 | 47 12 38 | 2095 |
| | Sun | E. | 38 40 35 | 2395 | 36 56 53 | 2385 | 35 12 57 | 2378 | 33 28 50 | 2371 |
| 23 | Sun | W. | 32 3 6 | 2517 | 33 43 55 | 2532 | 35 24 24 | 2546 | 37 4 33 | 2561 |
| | Spica | E. | 49 19 54 | 2186 | 47 31 5 | 2201 | 45 42 39 | 2217 | 43 54 37 | 2234 |
| | Jupiter | E. | 79 13 40 | 2208 | 77 25 25 | 2225 | 75 37 35 | 2241 | 73 50 9 | 2258 |
| | Antares | E. | 95 14 21 | 2185 | 93 25 31 | 2201 | 91 37 5 | 2217 | 89 49 3 | 2233 |
| 24 | Sun | W. | 45 19 46 | 2647 | 46 57 37 | 2665 | 48 35 4 | 2684 | 50 12 6 | 2703 |
| | Spica | E. | 35 0 47 | 2322 | 33 15 19 | 2339 | 31 30 17 | 2358 | 29 45 42 | 2377 |
| | Jupiter | E. | 64 59 27 | 2349 | 63 14 39 | 2368 | 61 30 19 | 2387 | 59 46 26 | 2407 |
| | Antares | E. | 80 55 9 | 2321 | 79 9 40 | 2339 | 77 24 37 | 2357 | 75 40 1 | 2376 |
| 25 | Sun | W. | 58 10 51 | 2800 | 59 45 19 | 2819 | 61 19 22 | 2838 | 62 53 0 | 2859 |
| | Spica | E. | 21 9 30 | 2471 | 19 27 36 | 2490 | 17 46 9 | 2509 | 16 5 8 | 2529 |
| | Jupiter | E. | 51 14 4 | 2507 | 49 33 1 | 2527 | 47 52 26 | 2548 | 46 12 20 | 2569 |
| | Antares | E. | 67 3 40 | 2469 | 65 21 43 | 2488 | 63 40 13 | 2507 | 61 59 9 | 2525 |
| 26 | Sun | W. | 70 34 52 | 2955 | 72 6 1 | 2974 | 73 36 46 | 2993 | 75 7 8 | 3011 |
| | Jupiter | E. | 37 59 1 | 2675 | 36 21 48 | 2698 | 34 45 5 | 2720 | 33 8 52 | 2744 |
| | Antares | E. | 53 40 10 | 2616 | 52 1 37 | 2634 | 50 23 28 | 2652 | 48 45 43 | 2669 |
| | α Aquilæ | E. | 104 40 51 | 3451 | 103 19 32 | 3458 | 101 58 21 | 3465 | 100 37 18 | 3474 |
| 27 | Sun | W. | 82 33 21 | 3099 | 84 1 32 | 3116 | 85 29 22 | 3133 | 86 56 52 | 3148 |
| | Antares | E. | 40 42 39 | 2751 | 39 7 7 | 2767 | 37 31 56 | 2782 | 35 57 5 | 2797 |
| | α Aquilæ | E. | 93 54 49 | 3530 | 92 34 58 | 3545 | 91 15 23 | 3558 | 89 56 3 | 3574 |
| 28 | Sun | W. | 94 9 42 | 3223 | 95 35 24 | 3237 | 97 0 49 | 3250 | 98 25 59 | 3264 |
| | Spica | W. | 17 47 57 | 2868 | 19 20 57 | 2881 | 20 53 40 | 2894 | 22 26 7 | 2905 |
| | Antares | E. | 28 7 32 | 2867 | 26 34 31 | 2880 | 25 1 46 | 2892 | 23 29 17 | 2904 |
| | α Aquilæ | E. | 83 23 43 | 3658 | 82 6 11 | 3677 | 80 48 59 | 3696 | 79 32 8 | 3716 |
| 29 | Sun | W. | 105 28 9 | 3322 | 106 51 55 | 3332 | 108 15 30 | 3342 | 109 38 53 | 3351 |
| | Spica | W. | 30 4 52 | 2958 | 31 35 58 | 2967 | 33 6 52 | 2976 | 34 37 35 | 2985 |
| | α Aquilæ | E. | 73 13 22 | 3826 | 71 58 47 | 3852 | 70 44 38 | 3877 | 69 30 55 | 3904 |
| 30 | Sun | W. | 116 33 16 | 3393 | 117 55 41 | 3399 | 119 17 59 | 3406 | 120 40 9 | 3412 |
| | Spica | W. | 42 8 38 | 3022 | 43 38 24 | 3028 | 45 8 2 | 3034 | 46 37 33 | 3039 |
| | α Aquilæ | E. | 63 29 27 | 4056 | 62 18 43 | 4091 | 61 8 33 | 4129 | 59 58 59 | 4168 |
| 31 | Spica | W. | 54 3 39 | 3060 | 55 32 37 | 3063 | 57 1 32 | 3066 | 58 30 23 | 3069 |
| | α Aquilæ | E. | 54 21 11 | 4404 | 53 15 53 | 4459 | 52 11 25 | 4520 | 51 7 51 | 4586 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 16 | Fomalhaut | W. | 85° 44′ 34″ | 2494 | 87° 25′ 56″ | 2477 | 89° 7′ 41″ | 2462 | 90° 49′ 47″ | 2448 |
| | Saturn | W. | 78 31 35 | 2227 | 80 19 22 | 2211 | 82 7 33 | 2196 | 83 56 6 | 2181 |
| | α Pegasi | W. | 63 58 26 | 2552 | 65 38 27 | 2527 | 67 19 2 | 2504 | 69 0 9 | 2483 |
| | Sun | E. | 59 2 5 | 2556 | 57 22 10 | 2540 | 55 41 53 | 2525 | 54 1 14 | 2509 |
| 17 | Fomalhaut | W. | 99 25 9 | 2387 | 101 9 3 | 2377 | 102 53 11 | 2369 | 104 37 30 | 2362 |
| | Saturn | W. | 93 4 21 | 2112 | 94 55 2 | 2099 | 96 46 3 | 2086 | 98 37 23 | 2075 |
| | α Pegasi | W. | 77 32 59 | 2387 | 79 16 52 | 2372 | 81 1 7 | 2357 | 82 45 44 | 2343 |
| | α Arietis | W. | 34 25 22 | 2206 | 36 13 40 | 2187 | 38 2 27 | 2169 | 39 51 41 | 2152 |
| | Sun | E. | 45 32 49 | 2440 | 43 50 11 | 2427 | 42 7 15 | 2416 | 40 24 3 | 2405 |
| 18 | Saturn | W. | 107 58 21 | 2023 | 109 51 19 | 2016 | 111 44 29 | 2008 | 113 37 51 | 2000 |
| | α Pegasi | W. | 91 33 22 | 2289 | 93 19 38 | 2282 | 95 6 4 | 2275 | 96 52 40 | 2270 |
| | α Arietis | W. | 49 3 45 | 2083 | 50 55 10 | 2073 | 52 46 51 | 2062 | 54 38 48 | 2053 |
| | Sun | E. | 31 44 33 | 2365 | 30 0 8 | 2360 | 28 15 36 | 2358 | 26 31 1 | 2357 |
| 23 | Sun | W. | 38 44 21 | 2577 | 40 23 47 | 2594 | 42 2 50 | 2611 | 43 41 30 | 2629 |
| | Spica | E. | 42 7 0 | 2251 | 40 19 48 | 2268 | 38 33 2 | 2285 | 36 46 41 | 2304 |
| | Jupiter | E. | 72 3 8 | 2276 | 70 16 33 | 2294 | 68 30 24 | 2312 | 66 44 42 | 2331 |
| | Antares | E. | 88 1 25 | 2251 | 86 14 13 | 2268 | 84 27 26 | 2285 | 82 41 5 | 2302 |
| 24 | Sun | W. | 51 48 42 | 2722 | 53 24 53 | 2741 | 55 0 38 | 2761 | 56 35 57 | 2780 |
| | Spica | E. | 28 1 34 | 2396 | 26 17 53 | 2415 | 24 34 39 | 2433 | 22 51 51 | 2452 |
| | Jupiter | E. | 58 3 1 | 2426 | 56 20 4 | 2447 | 54 37 36 | 2467 | 52 55 36 | 2487 |
| | Antares | E. | 73 55 52 | 2394 | 72 12 9 | 2413 | 70 28 53 | 2431 | 68 46 3 | 2450 |
| 25 | Sun | W. | 64 26 12 | 2878 | 65 58 59 | 2898 | 67 31 21 | 2916 | 69 3 19 | 2936 |
| | Spica | E. | 14 24 35 | 2548 | 12 44 29 | 2568 | 11 4 50 | 2588 | 9 25 39 | 2609 |
| | Jupiter | E. | 44 32 43 | 2590 | 42 53 34 | 2611 | 41 14 54 | 2632 | 39 36 43 | 2654 |
| | Antares | E. | 60 18 30 | 2543 | 58 38 17 | 2562 | 56 58 30 | 2580 | 55 19 8 | 2598 |
| 26 | Sun | W. | 76 37 7 | 3030 | 78 6 43 | 3047 | 79 35 57 | 3065 | 81 4 50 | 3082 |
| | Jupiter | E. | 31 33 10 | 2767 | 29 57 59 | 2792 | 28 23 21 | 2817 | 26 49 15 | 2843 |
| | Antares | E. | 47 8 21 | 2686 | 45 31 22 | 2703 | 43 54 46 | 2719 | 42 18 32 | 2735 |
| | α Aquilæ | E. | 99 16 25 | 3484 | 97 55 43 | 3494 | 96 35 12 | 3506 | 95 14 54 | 3517 |
| 27 | Sun | W. | 88 24 3 | 3164 | 89 50 55 | 3180 | 91 17 28 | 3194 | 92 43 44 | 3209 |
| | Antares | E. | 34 22 33 | 2811 | 32 48 20 | 2826 | 31 14 26 | 2840 | 29 40 50 | 2854 |
| | α Aquilæ | E. | 88 37 0 | 3589 | 87 18 14 | 3605 | 85 59 45 | 3623 | 84 41 35 | 3639 |
| 28 | Sun | W. | 99 50 53 | 3276 | 101 15 33 | 3288 | 102 39 58 | 3300 | 104 4 10 | 3311 |
| | Spica | W. | 23 58 20 | 2916 | 25 30 19 | 2927 | 27 2 3 | 2938 | 28 33 34 | 2948 |
| | Antares | E. | 21 57 3 | 2916 | 20 25 4 | 2927 | 18 53 20 | 2939 | 17 21 50 | 2948 |
| | α Aquilæ | E. | 78 15 38 | 3737 | 76 59 30 | 3758 | 75 43 44 | 3780 | 74 28 21 | 3803 |
| 29 | Sun | W. | 111 2 6 | 3360 | 112 25 8 | 3369 | 113 48 0 | 3378 | 115 10 42 | 3385 |
| | Spica | W. | 36 8 7 | 2993 | 37 38 20 | 3001 | 39 8 41 | 3008 | 40 38 44 | 3015 |
| | α Aquilæ | E. | 68 17 39 | 3931 | 67 4 51 | 3960 | 65 52 32 | 3991 | 64 40 44 | 4023 |
| 30 | Sun | W. | 122 2 12 | 3417 | 123 24 9 | 3423 | 124 46 0 | 3428 | 126 7 45 | 3432 |
| | Spica | W. | 48 6 58 | 3044 | 49 36 16 | 3049 | 51 5 28 | 3052 | 52 34 36 | 3056 |
| | α Aquilæ | E. | 58 50 3 | 4210 | 57 41 46 | 4253 | 56 34 10 | 4301 | 55 27 18 | 4350 |
| 31 | Spica | W. | 59 59 11 | 3070 | 61 27 57 | 3073 | 62 56 40 | 3073 | 64 25 22 | 3074 |
| | α Aquilæ | E. | 50 5 14 | 4656 | 49 3 37 | 4733 | 48 3 5 | 4815 | 47 3 41 | 4905 |

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be added to* / *subtracted from* *Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | Semi-diameter. | | | |
| | | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Tues. | 1 | 8 47 47.89 | 9.693 | N.17 53 11.1 | -38.19 | 15 48.11 | 66.60 | 6 2.31 | 0.164 |
| Wed. | 2 | 8 51 40.21 | 9.668 | 17 37 45.8 | 38.91 | 15 48.25 | 66.51 | 5 58.08 | 0.189 |
| Thur. | 3 | 8 55 31.91 | 9.642 | 17 22 3.4 | 39.62 | 15 48.39 | 66.43 | 5 53.23 | 0.215 |
| Frid. | 4 | 8 59 23.00 | 9.617 | 17 6 4.1 | 40.32 | 15 48.53 | 66.34 | 5 47.78 | 0.240 |
| Sat. | 5 | 9 3 13.49 | 9.592 | 16 49 48.2 | 41.01 | 15 48.67 | 66.26 | 5 41.73 | 0.265 |
| *Sun.* | 6 | 9 7 3.39 | 9.568 | 16 33 16.0 | 41.68 | 15 48.82 | 66.17 | 5 35.09 | 0.289 |
| Mon. | 7 | 9 10 52.71 | 9.443 | 16 16 27.8 | 42.33 | 15 48.97 | 66.09 | 5 27.89 | 0.313 |
| Tues. | 8 | 9 14 41.46 | 9.519 | 15 59 23.9 | 42.98 | 15 49.12 | 66.00 | 5 20.09 | 0.337 |
| Wed. | 9 | 9 18 29.62 | 9.495 | 15 42 4.4 | 43.63 | 15 49.27 | 65.92 | 5 11.71 | 0.361 |
| Thur. | 10 | 9 22 17.20 | 9.472 | 15 24 29.7 | 44.26 | 15 49.43 | 65.83 | 5 2.77 | 0.384 |
| Frid. | 11 | 9 26 4.24 | 9.449 | 15 6 40.2 | 44.88 | 15 49.58 | 65.75 | 4 53.29 | 0.407 |
| Sat. | 12 | 9 29 50.75 | 9.427 | 14 48 36.0 | 45.48 | 15 49.75 | 65.66 | 4 43.26 | 0.429 |
| *Sun.* | 13 | 9 33 36.73 | 9.405 | 14 30 17.5 | 46.07 | 15 49.92 | 65.58 | 4 32.72 | 0.451 |
| Mon. | 14 | 9 37 22.19 | 9.384 | 14 11 45.1 | 46.64 | 15 50.09 | 65.50 | 4 21.65 | 0.472 |
| Tues. | 15 | 9 41 7.13 | 9.363 | 13 52 59.1 | 47.20 | 15 50.26 | 65.42 | 4 10.06 | 0.494 |
| Wed. | 16 | 9 44 51.55 | 9.341 | 13 33 59.8 | 47.75 | 15 50.44 | 65.35 | 3 57.96 | 0.515 |
| Thur. | 17 | 9 48 35.47 | 9.320 | 13 14 47.3 | 48.28 | 15 50.62 | 65.27 | 3 45.36 | 0.536 |
| Frid. | 18 | 9 52 18.89 | 9.300 | 12 55 22.0 | 48.81 | 15 50.81 | 65.20 | 3 32.26 | 0.556 |
| Sat. | 19 | 9 56 1.82 | 9.280 | 12 35 44.4 | 49.32 | 15 51.00 | 65.13 | 3 18.67 | 0.576 |
| *Sun.* | 20 | 9 59 44.27 | 9.260 | 12 15 54.8 | 49.81 | 15 51.20 | 65.06 | 3 4.60 | 0.596 |
| Mon. | 21 | 10 3 26.24 | 9.240 | 11 55 53.7 | 50.29 | 15 51.41 | 64.99 | 2 50.07 | 0.615 |
| Tues. | 22 | 10 7 7.76 | 9.220 | 11 35 41.2 | 50.75 | 15 51.61 | 64.93 | 2 35.07 | 0.634 |
| Wed. | 23 | 10 10 48.84 | 9.201 | 11 15 17.6 | 51.20 | 15 51.82 | 64.87 | 2 19.62 | 0.653 |
| Thur. | 24 | 10 14 29.47 | 9.183 | 10 54 43.4 | 51.64 | 15 52.04 | 64.81 | 2 3.74 | 0.671 |
| Frid. | 25 | 10 18 9.67 | 9.165 | 10 33 59.0 | 52.06 | 15 52.26 | 64.75 | 1 47.44 | 0.688 |
| Sat. | 26 | 10 21 49.45 | 9.148 | 10 13 4.6 | 52.47 | 15 52.48 | 64.69 | 1 30.72 | 0.705 |
| *Sun.* | 27 | 10 25 28.83 | 9.132 | 9 52 0.6 | 52.86 | 15 52.70 | 64.63 | 1 13.59 | 0.721 |
| Mon. | 28 | 10 29 7.83 | 9.117 | 9 30 47.2 | 53.24 | 15 52.93 | 64.58 | 0 56.07 | 0.737 |
| Tues. | 29 | 10 32 46.46 | 9.102 | 9 9 24.9 | 53.61 | 15 53.16 | 64.53 | 0 38.20 | 0.752 |
| Wed. | 30 | 10 36 24.73 | 9.088 | 8 47 54.0 | 53.97 | 15 53.39 | 64.48 | 0 19.96 | 0.766 |
| Thur. | 31 | 10 40 2.68 | 9.075 | 8 26 14.7 | 54.31 | 15 53.62 | 64.43 | 0 1.22 | 0.779 |
| Frid. | 32 | 10 43 40.31 | 9.062 | N. 8 4 27.2 | -54.64 | 15 53.86 | 64.39 | 0 17.45 | 0.792 |

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing.

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S |  |  |  | Equation of Time, *to be subtracted from* / *added to* *Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
|  |  | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. |  |  |  |
|  |  | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Tues. | 1 | 8 47 46.92 | 9.693 | N.17 53 15.0 | -38.19 | 6 2.33 | 0.164 | 8 41 44.59 |
| Wed. | 2 | 8 51 39.25 | 9.668 | 17 37 49.7 | 38.91 | 5 58.10 | 0.189 | 8 45 41.15 |
| Thur. | 3 | 8 55 30.96 | 9.642 | 17 22 7.3 | 39.62 | 5 53.26 | 0.215 | 8 49 37.70 |
| Frid. | 4 | 8 59 22.06 | 9.617 | 17 6 8.0 | 40.32 | 5 47.80 | 0.240 | 8 53 34.26 |
| Sat. | 5 | 9 3 12.57 | 9.592 | 16 49 52.1 | 41.01 | 5 41.75 | 0.265 | 8 57 30.82 |
| *Sun.* | 6 | 9 7 2.49 | 9.568 | 16 33 19.9 | 41.68 | 5 35.11 | 0.289 | 9 1 27.38 |
| Mon. | 7 | 9 10 51.84 | 9.544 | 16 16 31.6 | 42.33 | 5 27.91 | 0.313 | 9 5 23.93 |
| Tues. | 8 | 9 14 40.61 | 9.520 | 15 59 27.7 | 42.98 | 5 20.12 | 0.337 | 9 9 20.49 |
| Wed. | 9 | 9 18 28.79 | 9.496 | 15 42 8.2 | 43.63 | 5 11.75 | 0.361 | 9 13 17.04 |
| Thur. | 10 | 9 22 16.40 | 9.473 | 15 24 33.5 | 44.26 | 5 2.80 | 0.384 | 9 17 13.60 |
| Frid. | 11 | 9 26 3.47 | 9.450 | 15 6 43.9 | 44.88 | 4 53.32 | 0.407 | 9 21 10.15 |
| Sat. | 12 | 9 29 50.00 | 9.428 | 14 48 39.6 | 45.48 | 4 43.29 | 0.429 | 9 25 6.71 |
| *Sun.* | 13 | 9 33 36.01 | 9.406 | 14 30 21.0 | 46.07 | 4 32.75 | 0.451 | 9 29 3.26 |
| Mon. | 14 | 9 37 21.50 | 9.385 | 14 11 48.5 | 46.64 | 4 21.68 | 0.472 | 9 32 59.82 |
| Tues. | 15 | 9 41 6.47 | 9.364 | 13 53 2.4 | 47.20 | 4 10.09 | 0.494 | 9 36 56.38 |
| Wed. | 16 | 9 44 50.93 | 9.342 | 13 34 2.9 | 47.75 | 3 57.99 | 0.515 | 9 40 52.94 |
| Thur. | 17 | 9 48 34.88 | 9.321 | 13 14 50.3 | 48.29 | 3 45.39 | 0.536 | 9 44 49.49 |
| Frid. | 18 | 9 52 18.33 | 9.301 | 12 55 24.9 | 48.82 | 3 32.28 | 0.556 | 9 48 46.05 |
| Sat. | 19 | 9 56 1.30 | 9.281 | 12 35 47.2 | 49.33 | 3 18.70 | 0.576 | 9 52 42.60 |
| *Sun.* | 20 | 9 59 43.79 | 9.261 | 12 15 57.4 | 49.82 | 3 4.63 | 0.596 | 9 56 39.16 |
| Mon. | 21 | 10 3 25.81 | 9.241 | 11 55 56.1 | 50.30 | 2 50.10 | 0.615 | 10 0 35.71 |
| Tues. | 22 | 10 7 7.37 | 9.222 | 11 35 43.3 | 50.76 | 2 35.10 | 0.634 | 10 4 32.27 |
| Wed. | 23 | 10 10 48.48 | 9.203 | 11 15 19.6 | 51.21 | 2 19.66 | 0.653 | 10 8 28.82 |
| Thur. | 24 | 10 14 29.15 | 9.185 | 10 54 45.2 | 51.65 | 2 3.77 | 0.671 | 10 12 25.38 |
| Frid. | 25 | 10 18 9.39 | 9.167 | 10 34 0.5 | 52.07 | 1 47.26 | 0.688 | 10 16 21.93 |
| Sat. | 26 | 10 21 49.22 | 9.150 | 10 13 5.9 | 52.48 | 1 30.73 | 0.705 | 10 20 18.49 |
| *Sun.* | 27 | 10 25 28.64 | 9.134 | 9 52 1.6 | 52.87 | 1 13.60 | 0.721 | 10 24 15.04 |
| Mon. | 28 | 10 29 7.68 | 9.119 | 9 30 48.0 | 53.25 | 0 56.08 | 0.737 | 10 28 11.60 |
| Tues. | 29 | 10 32 46.36 | 9.104 | 9 9 25.5 | 53.62 | 0 38.21 | 0.752 | 10 32 8.15 |
| Wed. | 30 | 10 36 24.68 | 9.090 | 8 47 54.3 | 53.98 | 0 19.97 | 0.766 | 10 36 4.71 |
| Thur. | 31 | 10 40 2.68 | 9.077 | 8 26 14.7 | 54.32 | 0 1.42 | 0.779 | 10 40 1.26 |
| Frid. | 32 | 10 43 40.36 | 9.064 | N. 8 4 26.9 | -54.65 | 0 17.46 | 0.792 | 10 43 57.82 |

**NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.**

**— prefixed to the hourly change of declination, indicates that north declinations are decreasing.**

Diff. for 1 hour.
+9ˢ.8565

AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S True LONGITUDE. λ | λ′ | Diff. for 1 hour. | LATITUDE. | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 214 | 129 30 29.3 | 29 56.3 | 143.54 | −0.56 | 0.0063153 | −25.6 | 15 15 44.97 |
| 2 | 215 | 130 27 54.7 | 27 21.6 | 143.57 | 0.55 | .0062533 | 26.1 | 15 11 49.06 |
| 3 | 216 | 131 25 21.0 | 24 47.8 | 143.61 | 0.50 | .0061899 | 26.6 | 15 7 53.15 |
| 4 | 217 | 132 22 48.2 | 22 14.8 | 143.65 | 0.42 | .0061253 | 27.1 | 15 3 57.24 |
| 5 | 218 | 133 20 16.3 | 19 42.7 | 143.69 | 0.32 | .0060596 | 27.6 | 15 0 1.33 |
| 6 | 219 | 134 17 45.5 | 17 11.7 | 143.74 | 0.20 | .0059927 | 28.1 | 14 56 5.42 |
| 7 | 220 | 135 15 15.9 | 14 42.0 | 143.79 | −0.08 | .0059246 | 28.6 | 14 52 9.50 |
| 8 | 221 | 136 12 47.5 | 12 13.5 | 143.85 | +0.05 | .0058553 | 29.1 | 14 48 13.59 |
| 9 | 222 | 137 10 20.5 | 9 46.3 | 143.90 | 0.18 | .0057847 | 29.6 | 14 44 17.68 |
| 10 | 223 | 138 7 54.8 | 7 20.4 | 143.96 | 0.30 | .0057129 | 30.2 | 14 40 21.77 |
| 11 | 224 | 139 5 30.6 | 4 56.1 | 144.02 | 0.40 | .0056398 | 30.8 | 14 36 25.87 |
| 12 | 225 | 140 3 7.9 | 2 33.3 | 144.09 | 0.49 | .0055651 | 31.5 | 14 32 29.96 |
| 13 | 226 | 141 0 46.7 | 0 12.0 | 144.15 | 0.55 | .0054886 | 32.2 | 14 28 34.05 |
| 14 | 227 | 141 58 27.1 | 57 52.2 | 144.21 | 0.57 | .0054105 | 32.9 | 14 24 38.14 |
| 15 | 228 | 142 56 9.0 | 55 33.9 | 144.27 | 0.56 | .0053309 | 33.7 | 14 20 42.22 |
| 16 | 229 | 143 53 52.4 | 53 17.2 | 144.33 | 0.53 | .0052490 | 34.5 | 14 16 46.31 |
| 17 | 230 | 144 51 37.4 | 51 2.1 | 144.40 | 0.45 | .0051650 | 35.3 | 14 12 50.40 |
| 18 | 231 | 145 49 23.9 | 48 48.5 | 144.47 | 0.37 | .0050791 | 36.2 | 14 8 54.49 |
| 19 | 232 | 146 47 12.0 | 46 36.4 | 144.53 | 0.25 | .0049912 | 37.0 | 14 4 58.58 |
| 20 | 233 | 147 45 1.5 | 44 25.7 | 144.59 | +0.13 | .0049011 | 37.9 | 14 1 2.67 |
| 21 | 234 | 148 42 52.4 | 42 16.5 | 144.65 | 0.00 | .0048091 | 38.7 | 13 57 6.76 |
| 22 | 235 | 149 40 44.6 | 40 8.6 | 144.71 | −0.13 | .0047149 | 39.5 | 13 53 10.85 |
| 23 | 236 | 150 38 38.2 | 38 2.1 | 144.77 | 0.26 | .0046189 | 40.3 | 13 49 14.95 |
| 24 | 237 | 151 36 33.1 | 35 56.8 | 144.82 | 0.37 | .0045210 | 41.1 | 13 45 19.04 |
| 25 | 238 | 152 34 29.3 | 33 52.8 | 144.87 | 0.48 | .0044214 | 41.8 | 13 41 23.13 |
| 26 | 239 | 153 32 26.8 | 31 50.3 | 144.92 | 0.54 | .0043202 | 42.4 | 13 37 27.22 |
| 27 | 240 | 154 30 25.6 | 29 49.0 | 144.97 | 0.58 | .0042176 | 42.9 | 13 33 31.31 |
| 28 | 241 | 155 28 25.8 | 27 49.1 | 145.02 | 0.59 | .0041139 | 43.4 | 13 29 35.40 |
| 29 | 242 | 156 26 27.4 | 25 50.5 | 145.08 | 0.56 | .0040092 | 43.8 | 13 25 39.49 |
| 30 | 243 | 157 24 30.3 | 23 53.3 | 145.15 | 0.52 | .0039035 | 44.1 | 13 21 43.59 |
| 31 | 244 | 158 22 34.7 | 21 57.6 | 145.21 | 0.44 | .0037971 | 44.4 | 13 17 47.67 |
| 32 | 245 | 159 20 40.6 | 20 3.3 | 145.28 | −0.35 | 0.0036901 | −44.7 | 13 13 51.76 |

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour. $-9^s.8296$

## GREENWICH MEAN TIME.

### THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | MERIDIAN PASSAGE. | | AGE. |
|---|---|---|---|---|---|---|---|---|---|
| | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. | | Diff. for 1 hour. | Noon. |
| | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 14 45.5 | 14 45.5 | 54 3.1 | –0.23 | 54 1.3 | –0.08 | 9 29.4 | 2.15 | 11.3 |
| 2 | 14 45.0 | 14 45.4 | 54 1.2 | +0.07 | 54 2.8 | +0.20 | 10 20.5 | 2.10 | 12.3 |
| 3 | 14 46.3 | 14 47.6 | 54 6.0 | 0.33 | 54 10.6 | 0.44 | 11 10.0 | 2.02 | 13.3 |
| 4 | 14 49.2 | 14 51.2 | 54 16.6 | 0.55 | 54 23.7 | 0.64 | 11 57.2 | 1.92 | 14.3 |
| 5 | 14 53.4 | 14 56.0 | 54 32.0 | 0.73 | 54 41.3 | 0.82 | 12 42.1 | 1.82 | 15.3 |
| 6 | 14 58.8 | 15 1.8 | 54 51.7 | 0.90 | 55 3.0 | 0.98 | 13 25.0 | 1.76 | 16.3 |
| 7 | 15 5.2 | 15 8.8 | 55 15.3 | 1.06 | 55 28.5 | 1.14 | 14 6.7 | 1.73 | 17.3 |
| 8 | 15 12.6 | 15 16.7 | 55 42.7 | 1.22 | 55 57.8 | 1.30 | 14 48.2 | 1.74 | 18.3 |
| 9 | 15 21.1 | 15 25.8 | 56 13.9 | 1.38 | 56 31.0 | 1.46 | 15 30.8 | 1.81 | 19.3 |
| 10 | 15 30.7 | 15 35.8 | 56 48.9 | 1.53 | 57 7.7 | 1.59 | 16 15.7 | 1.94 | 20.3 |
| 11 | 15 41.0 | 15 46.5 | 57 27.1 | 1.65 | 57 47.2 | 1.69 | 17 4.3 | 2.12 | 21.3 |
| 12 | 15 52.1 | 15 57.7 | 58 7.6 | 1.72 | 58 28.4 | 1.73 | 17 57.7 | 2.34 | 22.3 |
| 13 | 16 3.4 | 16 8.8 | 58 49.0 | 1.70 | 59 9.2 | 1.66 | 18 56.5 | 2.56 | 23.3 |
| 14 | 16 14.1 | 16 19.1 | 59 28.6 | 1.57 | 59 46.7 | 1.44 | 19 59.9 | 2.71 | 24.3 |
| 15 | 16 23.5 | 16 27.3 | 60 2.9 | 1.26 | 60 16.9 | 1.06 | 21 5.3 | 2.72 | 25.3 |
| 16 | 16 30.4 | 16 32.5 | 60 28.1 | 0.81 | 60 36.1 | +0.53 | 22 9.5 | 2.61 | 26.3 |
| 17 | 16 33.8 | 16 33.9 | 60 40.6 | +0.21 | 60 41.1 | –0.13 | 23 9.9 | 2.42 | 27.3 |
| 18 | 16 32.9 | 16 30.9 | 60 37.6 | –0.46 | 60 30.0 | 0.79 | | | 28.3 |
| 19 | 16 27.8 | 16 23.6 | 60 18.6 | 1.11 | 60 3.4 | 1.41 | 0 5.5 | 2.22 | 0.0 |
| 20 | 16 18.6 | 16 12.8 | 59 45.0 | 1.66 | 59 23.6 | 1.88 | 0 56.8 | 2.06 | 1.0 |
| 21 | 16 6.4 | 15 59.4 | 59 0.0 | 2.05 | 58 34.7 | 2.16 | 1 44.9 | 1.95 | 2.0 |
| 22 | 15 52.3 | 15 44.9 | 58 8.3 | 2.23 | 57 41.5 | 2.24 | 2 31.1 | 1.91 | 3.0 |
| 23 | 15 37.7 | 15 30.6 | 57 14.7 | 2.21 | 56 48.6 | 2.14 | 3 16.9 | 1.91 | 4.0 |
| 24 | 15 23.8 | 15 17.4 | 56 23.6 | 2.02 | 56 0.2 | 1.88 | 4 3.2 | 1.95 | 5.0 |
| 25 | 15 11.5 | 15 6.1 | 55 38.5 | 1.73 | 55 18.8 | 1.55 | 4 50.9 | 2.02 | 6.0 |
| 26 | 15 1.4 | 14 57.4 | 55 1.4 | 1.35 | 54 46.5 | 1.14 | 5 40.3 | 2.09 | 7.0 |
| 27 | 14 54.0 | 14 51.2 | 54 34.0 | 0.94 | 54 24.0 | 0.73 | 6 31.2 | 2.15 | 8.0 |
| 28 | 14 49.1 | 14 47.8 | 54 16.4 | 0.53 | 54 11.4 | –0.32 | 7 23.0 | 2.16 | 9.0 |
| 29 | 14 47.0 | 14 47.0 | 54 8.7 | –0.12 | 54 8.4 | +0.07 | 8 14.5 | 2.12 | 10.0 |
| 30 | 14 47.5 | 14 48.5 | 54 10.2 | +0.24 | 54 14.1 | 0.40 | 9 4.7 | 2.05 | 11.0 |
| 31 | 14 50.1 | 14 52.1 | 54 19.8 | 0.55 | 54 27.3 | 0.69 | 9 52.9 | 1.96 | 12.0 |
| 32 | 14 54.6 | 14 57.4 | 54 36.3 | +0.81 | 54 46.6 | +0.91 | 10 38.7 | 1.86 | 13.0 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | **TUESDAY 1.** | | | | | **THURSDAY 3.** | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 17 51 23.27 | 2.2433 | S.28 32 48.3 | −0.103 | 0 | 19 37 34.64 | 2.1550 | S.26 1 38.1 | 6.266 |
| 1 | 17 53 37.86 | 2.2431 | 28 32 50.3 | +0.036 | 1 | 19 39 43.84 | 2.1517 | 25 55 18.5 | 6.387 |
| 2 | 17 55 52.44 | 2.2429 | 28 32 44.0 | 0.174 | 2 | 19 41 52.84 | 2.1483 | 25 48 51.7 | 6.507 |
| 3 | 17 58 7.01 | 2.2427 | 28 32 29.4 | 0.312 | 3 | 19 44 1.63 | 2.1448 | 25 42 17.7 | 6.627 |
| 4 | 18 0 21.56 | 2.2423 | 28 32 6.5 | 0.451 | 4 | 19 46 10.22 | 2.1414 | 25 35 36.5 | 6.747 |
| 5 | 18 2 36.09 | 2.2419 | 28 31 35.3 | 0.589 | 5 | 19 48 18.60 | 2.1379 | 25 28 48.1 | 6.866 |
| 6 | 18 4 50.59 | 2.2414 | 28 30 55.8 | 0.728 | 6 | 19 50 26.77 | 2.1345 | 25 21 52.6 | 6.983 |
| 7 | 18 7 5.06 | 2.2408 | 28 30 8.0 | 0.866 | 7 | 19 52 34.74 | 2.1311 | 25 14 50.1 | 7.100 |
| 8 | 18 9 19.49 | 2.2402 | 28 29 11.9 | 1.003 | 8 | 19 54 42.50 | 2.1275 | 25 7 40.6 | 7.217 |
| 9 | 18 11 33.88 | 2.2394 | 28 28 7.6 | 1.141 | 9 | 19 56 50.04 | 2.1238 | 25 0 24.1 | 7.333 |
| 10 | 18 13 48.22 | 2.2386 | 28 26 55.0 | 1.279 | 10 | 19 58 57.36 | 2.1202 | 24 53 0.6 | 7.448 |
| 11 | 18 16 2.51 | 2.2377 | 28 25 34.1 | 1.417 | 11 | 20 1 4.46 | 2.1166 | 24 45 30.3 | 7.563 |
| 12 | 18 18 16.75 | 2.2368 | 28 24 5.0 | 1.554 | 12 | 20 3 11.35 | 2.1130 | 24 37 53.1 | 7.677 |
| 13 | 18 20 30.93 | 2.2357 | 28 22 27.6 | 1.692 | 13 | 20 5 18.02 | 2.1093 | 24 30 9.1 | 7.789 |
| 14 | 18 22 45.04 | 2.2345 | 28 20 42.0 | 1.828 | 14 | 20 7 24.46 | 2.1055 | 24 22 18.4 | 7.901 |
| 15 | 18 24 59.07 | 2.2332 | 28 18 48.2 | 1.965 | 15 | 20 9 30.68 | 2.1018 | 24 14 21.0 | 8.013 |
| 16 | 18 27 13.03 | 2.2320 | 28 16 46.2 | 2.102 | 16 | 20 11 36.68 | 2.0981 | 24 6 16.9 | 8.124 |
| 17 | 18 29 26.91 | 2.2307 | 28 14 36.0 | 2.238 | 17 | 20 13 42.45 | 2.0943 | 23 58 6.1 | 8.235 |
| 18 | 18 31 40.71 | 2.2293 | 28 12 17.7 | 2.373 | 18 | 20 15 48.00 | 2.0906 | 23 49 48.7 | 8.344 |
| 19 | 18 33 54.42 | 2.2278 | 28 9 51.2 | 2.509 | 19 | 20 17 53.32 | 2.0868 | 23 41 24.8 | 8.452 |
| 20 | 18 36 8.04 | 2.2262 | 28 7 16.6 | 2.645 | 20 | 20 19 58.41 | 2.0830 | 23 32 54.5 | 8.559 |
| 21 | 18 38 21.56 | 2.2244 | 28 4 33.8 | 2.781 | 21 | 20 22 3.28 | 2.0792 | 23 24 17.7 | 8.667 |
| 22 | 18 40 34.97 | 2.2226 | 28 1 42.9 | 2.916 | 22 | 20 24 7.92 | 2.0753 | 23 15 34.5 | 8.773 |
| 23 | 18 42 48.27 | 2.2208 | S.27 58 43.9 | 3.050 | 23 | 20 26 12.32 | 2.0714 | S.23 6 45.0 | 8.877 |
| | **WEDNESDAY 2.** | | | | | **FRIDAY 4.** | | | |
| 0 | 18 45 1.46 | 2.2189 | S.27 55 36.9 | 3.184 | 0 | 20 28 16.49 | 2.0676 | S.22 57 49.3 | 8.981 |
| 1 | 18 47 14.54 | 2.2170 | 27 52 21.8 | 3.318 | 1 | 20 30 20.43 | 2.0638 | 22 48 47.3 | 9.085 |
| 2 | 18 49 27.50 | 2.2149 | 27 48 58.7 | 3.451 | 2 | 20 32 24.14 | 2.0600 | 22 39 39.1 | 9.188 |
| 3 | 18 51 40.33 | 2.2128 | 27 45 27.7 | 3.584 | 3 | 20 34 27.63 | 2.0562 | 22 30 24.7 | 9.291 |
| 4 | 18 53 53.04 | 2.2107 | 27 41 48.7 | 3.717 | 4 | 20 36 30.89 | 2.0523 | 22 21 4.2 | 9.392 |
| 5 | 18 56 5.62 | 2.2085 | 27 38 1.7 | 3.849 | 5 | 20 38 33.91 | 2.0484 | 22 11 37.7 | 9.491 |
| 6 | 18 58 18.06 | 2.2062 | 27 34 6.8 | 3.981 | 6 | 20 40 36.70 | 2.0446 | 22 2 5.3 | 9.590 |
| 7 | 19 0 30.36 | 2.2039 | 27 30 4.0 | 4.113 | 7 | 20 42 39.26 | 2.0407 | 21 52 26.9 | 9.689 |
| 8 | 19 2 42.52 | 2.2015 | 27 25 53.4 | 4.243 | 8 | 20 44 41.59 | 2.0369 | 21 42 42.6 | 9.787 |
| 9 | 19 4 54.54 | 2.1990 | 27 21 34.9 | 4.373 | 9 | 20 46 43.69 | 2.0331 | 21 32 52.4 | 9.885 |
| 10 | 19 7 6.40 | 2.1964 | 27 17 8.6 | 4.503 | 10 | 20 48 45.56 | 2.0293 | 21 22 56.4 | 9.981 |
| 11 | 19 9 18.10 | 2.1937 | 27 12 34.5 | 4.632 | 11 | 20 50 47.20 | 2.0255 | 21 12 54.7 | 10.076 |
| 12 | 19 11 29.64 | 2.1910 | 27 7 52.7 | 4.761 | 12 | 20 52 48.62 | 2.0217 | 21 2 47.3 | 10.170 |
| 13 | 19 13 41.02 | 2.1883 | 27 3 3.2 | 4.889 | 13 | 20 54 49.81 | 2.0179 | 20 52 34.3 | 10.264 |
| 14 | 19 15 52.24 | 2.1856 | 26 58 6.0 | 5.017 | 14 | 20 56 50.77 | 2.0141 | 20 42 15.7 | 10.357 |
| 15 | 19 18 3.29 | 2.1828 | 26 53 1.1 | 5.145 | 15 | 20 58 51.50 | 2.0103 | 20 31 51.5 | 10.449 |
| 16 | 19 20 14.17 | 2.1799 | 26 47 48.6 | 5.272 | 16 | 21 0 52.01 | 2.0066 | 20 21 21.8 | 10.540 |
| 17 | 19 22 24.88 | 2.1770 | 26 42 28.5 | 5.398 | 17 | 21 2 52.30 | 2.0029 | 20 10 46.7 | 10.629 |
| 18 | 19 24 35.41 | 2.1739 | 26 37 0.8 | 5.524 | 18 | 21 4 52.36 | 1.9992 | 20 0 6.3 | 10.718 |
| 19 | 19 26 45.75 | 2.1708 | 26 31 25.6 | 5.649 | 19 | 21 6 52.20 | 1.9955 | 19 49 20.5 | 10.807 |
| 20 | 19 28 55.90 | 2.1677 | 26 25 42.9 | 5.773 | 20 | 21 8 51.82 | 1.9918 | 19 38 29.4 | 10.895 |
| 21 | 19 31 5.87 | 2.1646 | 26 19 52.8 | 5.897 | 21 | 21 10 51.22 | 1.9882 | 19 27 33.1 | 10.982 |
| 22 | 19 33 15.65 | 2.1614 | 26 13 55.3 | 6.020 | 22 | 21 12 50.40 | 1.9846 | 19 16 31.6 | 11.067 |
| 23 | 19 35 25.24 | 2.1582 | 26 7 50.4 | 6.143 | 23 | 21 14 49.37 | 1.9810 | 19 5 25.0 | 11.152 |
| 24 | 19 37 34.64 | 2.1550 | S.26 1 38.1 | 6.266 | 24 | 21 16 48.12 | 1.9774 | S.18 54 13.3 | 11.237 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| SATURDAY 5. | | | | | MONDAY 7. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 21 16 48.12 | 1.9774 | S. 18 54 13.3 | 11.237 | 0 | 22 48 19.59 | 1.8549 | S. 8 34 37.0 | 14.244 |
| 1 | 21 18 46.66 | 1.9739 | 18 42 56.6 | 11.320 | 1 | 22 50 10.85 | 1.8537 | 8 20 21.1 | 14.285 |
| 2 | 21 20 44.99 | 1.9703 | 18 31 34.9 | 11.402 | 2 | 22 52 2.03 | 1.8524 | 8 6 2.8 | 14.325 |
| 3 | 21 22 43.10 | 1.9668 | 18 20 8.3 | 11.484 | 3 | 22 53 53.14 | 1.8512 | 7 51 42.1 | 14.364 |
| 4 | 21 24 41.00 | 1.9634 | 18 8 36.8 | 11.564 | 4 | 22 55 44.18 | 1.8502 | 7 37 19.1 | 14.403 |
| 5 | 21 26 38.70 | 1.9600 | 17 57 0.6 | 11.643 | 5 | 22 57 35.16 | 1.8492 | 7 22 53.8 | 14.441 |
| 6 | 21 28 36.20 | 1.9566 | 17 45 19.6 | 11.722 | 6 | 22 59 26.09 | 1.8484 | 7 8 26.2 | 14.478 |
| 7 | 21 30 33.49 | 1.9532 | 17 33 33.9 | 11.801 | 7 | 23 1 16.97 | 1.8476 | 6 53 56.4 | 14.514 |
| 8 | 21 32 30.58 | 1.9499 | 17 21 43.5 | 11.878 | 8 | 23 3 7.80 | 1.8468 | 6 39 24.5 | 14.548 |
| 9 | 21 34 27.48 | 1.9466 | 17 9 48.5 | 11.954 | 9 | 23 4 58.59 | 1.8462 | 6 24 50.6 | 14.583 |
| 10 | 21 36 24.18 | 1.9433 | 16 57 49.0 | 12.029 | 10 | 23 6 49.34 | 1.8456 | 6 10 14.6 | 14.617 |
| 11 | 21 38 20.68 | 1.9401 | 16 45 45.0 | 12.104 | 11 | 23 8 40.06 | 1.8451 | 5 55 36.6 | 14.649 |
| 12 | 21 40 16.99 | 1.9369 | 16 33 36.5 | 12.178 | 12 | 23 10 30.75 | 1.8447 | 5 40 56.7 | 14.680 |
| 13 | 21 42 13.11 | 1.9337 | 16 21 23.6 | 12.251 | 13 | 23 12 21.42 | 1.8442 | 5 26 15.0 | 14.711 |
| 14 | 21 44 9.04 | 1.9307 | 16 9 6.4 | 12.322 | 14 | 23 14 12.06 | 1.8438 | 5 11 31.4 | 14.742 |
| 15 | 21 46 4.79 | 1.9277 | 15 56 44.9 | 12.393 | 15 | 23 16 2.68 | 1.8435 | 4 56 46.0 | 14.771 |
| 16 | 21 48 0.36 | 1.9247 | 15 44 19.2 | 12.463 | 16 | 23 17 53.28 | 1.8433 | 4 41 58.9 | 14.798 |
| 17 | 21 49 55.75 | 1.9217 | 15 31 49.3 | 12.532 | 17 | 23 19 43.87 | 1.8432 | 4 27 10.2 | 14.825 |
| 18 | 21 51 50.97 | 1.9188 | 15 19 15.3 | 12.601 | 18 | 23 21 34.46 | 1.8432 | 4 12 19.9 | 14.852 |
| 19 | 21 53 46.01 | 1.9158 | 15 6 37.2 | 12.668 | 19 | 23 23 25.05 | 1.8432 | 3 57 28.0 | 14.877 |
| 20 | 21 55 40.87 | 1.9129 | 14 53 55.1 | 12.735 | 20 | 23 25 15.65 | 1.8433 | 3 42 34.6 | 14.902 |
| 21 | 21 57 35.56 | 1.9101 | 14 41 9.0 | 12.801 | 21 | 23 27 6.25 | 1.8434 | 3 27 39.8 | 14.925 |
| 22 | 21 59 30.09 | 1.9074 | 14 28 19.0 | 12.865 | 22 | 23 28 56.86 | 1.8437 | 3 12 43.6 | 14.948 |
| 23 | 22 1 24.45 | 1.9047 | S. 14 15 25.2 | 12.929 | 23 | 23 30 47.49 | 1.8441 | S. 2 57 46.0 | 14.970 |
| SUNDAY 6. | | | | | TUESDAY 8. | | | | |
| 0 | 22 3 18.65 | 1.9020 | S. 14 2 27.5 | 12.993 | 0 | 23 32 38.15 | 1.8445 | S. 2 42 47.2 | 14.990 |
| 1 | 22 5 12.69 | 1.8994 | 13 49 26.0 | 13.055 | 1 | 23 34 28.83 | 1.8449 | 2 27 47.2 | 15.011 |
| 2 | 22 7 6.58 | 1.6969 | 13 36 20.9 | 13.116 | 2 | 23 36 19.54 | 1.8455 | 2 12 45.9 | 15.031 |
| 3 | 22 9 0.32 | 1.8944 | 13 23 12.1 | 13.177 | 3 | 23 38 10.29 | 1.8462 | 1 57 43.5 | 15.048 |
| 4 | 22 10 53.91 | 1.8920 | 13 9 59.7 | 13.236 | 4 | 23 40 1.08 | 1.8468 | 1 42 40.1 | 15.065 |
| 5 | 22 12 47.36 | 1.8896 | 12 56 43.8 | 13.294 | 5 | 23 41 51.91 | 1.8476 | 1 27 35.7 | 15.082 |
| 6 | 22 14 40.66 | 1.8872 | 12 43 24.4 | 13.352 | 6 | 23 43 42.79 | 1.8484 | 1 12 30.3 | 15.098 |
| 7 | 22 16 33.82 | 1.8849 | 12 30 1.5 | 13.409 | 7 | 23 45 33.72 | 1.8493 | 0 57 24.0 | 15.113 |
| 8 | 22 18 26.85 | 1.8827 | 12 16 35.3 | 13.465 | 8 | 23 47 24.71 | 1.8504 | 0 42 16.8 | 15.127 |
| 9 | 22 20 19.75 | 1.8805 | 12 3 5.7 | 13.521 | 9 | 23 49 15.77 | 1.8516 | 0 27 8.8 | 15.139 |
| 10 | 22 22 12.51 | 1.8783 | 11 49 32.8 | 13.575 | 10 | 23 51 6.90 | 1.8527 | S. 0 12 0.1 | 15.151 |
| 11 | 22 24 5.15 | 1.8763 | 11 35 56.7 | 13.629 | 11 | 23 52 58.09 | 1.8539 | N. 0 3 9.3 | 15.162 |
| 12 | 22 25 57.67 | 1.8743 | 11 22 17.4 | 13.682 | 12 | 23 54 49.36 | 1.8552 | 0 18 19.3 | 15.172 |
| 13 | 22 27 50.07 | 1.8723 | 11 8 34.9 | 13.733 | 13 | 23 56 40.71 | 1.8566 | 0 33 29.9 | 15.181 |
| 14 | 22 29 42.35 | 1.8704 | 10 54 49.4 | 13.783 | 14 | 23 58 32.15 | 1.8581 | 0 48 41.0 | 15.189 |
| 15 | 22 31 34.52 | 1.8686 | 10 41 0.9 | 13.832 | 15 | 0 0 23.69 | 1.8597 | 1 3 52.6 | 15.197 |
| 16 | 22 33 26.58 | 1.8668 | 10 27 9.5 | 13.882 | 16 | 0 2 15.32 | 1.8613 | 1 19 4.6 | 15.203 |
| 17 | 22 35 18.53 | 1.8050 | 10 13 15.1 | 13.931 | 17 | 0 4 7.05 | 1.8631 | 1 34 16.9 | 15.207 |
| 18 | 22 37 10.38 | 1.8634 | 9 59 17.8 | 13.978 | 18 | 0 5 58.89 | 1.8649 | 1 49 29.4 | 15.211 |
| 19 | 22 39 2.14 | 1.8619 | 9 45 17.7 | 14.024 | 19 | 0 7 50.84 | 1.8668 | 2 4 42.2 | 15.215 |
| 20 | 22 40 53.81 | 1.8603 | 9 31 14.9 | 14.069 | 20 | 0 9 42.91 | 1.8688 | 2 19 55.2 | 15.217 |
| 21 | 22 42 45.38 | 1.8588 | 9 17 9.4 | 14.114 | 21 | 0 11 35.10 | 1.8708 | 2 35 8.3 | 15.219 |
| 22 | 22 44 36.86 | 1.8574 | 9 3 1.2 | 14.158 | 22 | 0 13 27.41 | 1.8729 | 2 50 21.5 | 15.219 |
| 23 | 22 46 28.26 | 1.8561 | 8 48 50.4 | 14.202 | 23 | 0 15 19.85 | 1.8752 | 3 5 34.6 | 15.218 |
| 24 | 22 48 19.59 | 1.8549 | S. 8 34 37.0 | 14.244 | 24 | 0 17 12.43 | 1.8775 | N. 3 20 47.6 | 15.216 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | WEDNESDAY 9. | | | | | FRIDAY 11. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 0 17 12.43 | 1.8775 | N. 3 20 47.6 | 15.216 | 0 | 1 51 36.92 | 2.0893 | N.15 8 53.2 | 13.831 |
| 1 | 0 19 5.15 | 1.8799 | 3 36 0.5 | 15.214 | 1 | 1 53 42.47 | 2.0957 | 15 22 41.3 | 13.771 |
| 2 | 0 20 58.02 | 1.8824 | 3 51 13.3 | 15.212 | 2 | 1 55 48.41 | 2.1023 | 15 36 25.7 | 13.708 |
| 3 | 0 22 51 04 | 1.8850 | 4 6 25.9 | 15.207 | 3 | 1 57 54.75 | 2.1090 | 15 50 6.3 | 13.645 |
| 4 | 0 24 44.22 | 1.8876 | 4 21 38.1 | 15.201 | 4 | 2 0 1.49 | 2.1158 | 16 3 43.1 | 13.581 |
| 5 | 0 26 37.55 | 1.8903 | 4 36 50.0 | 15.194 | 5 | 2 2 8.64 | 2.1226 | 16 17 16.0 | 13.515 |
| 6 | 0 28 31.05 | 1.8931 | 4 52 1.4 | 15.186 | 6 | 2 4 16.20 | 2.1295 | 16 30 44.9 | 13.447 |
| 7 | 0 30 24.72 | 1.8960 | 5 7 12.3 | 15.177 | 7 | 2 6 24.18 | 2.1365 | 16 44 9.7 | 13.378 |
| 8 | 0 32 18.57 | 1.8990 | 5 22 22.7 | 15.168 | 8 | 2 8 32.58 | 2.1435 | 16 57 30.3 | 13.307 |
| 9 | 0 34 12.60 | 1.9021 | 5 37 32.5 | 15.157 | 9 | 2 10 41.40 | 2.1506 | 17 10 46.6 | 13.235 |
| 10 | 0 36 6.82 | 1.9052 | 5 52 41.6 | 15.145 | 10 | 2 12 50.65 | 2.1578 | 17 23 58.5 | 13.162 |
| 11 | 0 38 1.23 | 1.9084 | 6 7 49.9 | 15.132 | 11 | 2 15 0.33 | 2.1650 | 17 37 6.0 | 13.087 |
| 12 | 0 39 55.83 | 1.9117 | 6 22 57.5 | 15.119 | 12 | 2 17 10.45 | 2.1723 | 17 50 8.9 | 13.009 |
| 13 | 0 41 50.63 | 1.9151 | 6 38 4.2 | 15.104 | 13 | 2 19 21.01 | 2.1797 | 18 3 7.1 | 12.931 |
| 14 | 0 43 45.64 | 1.9187 | 6 53 10.0 | 15.088 | 14 | 2 21 32.02 | 2.1872 | 18 16 0.6 | 12.851 |
| 15 | 0 45 40 87 | 1.9223 | 7 8 14.8 | 15.071 | 15 | 2 23 43.47 | 2.1946 | 18 28 49.2 | 12.769 |
| 16 | 0 47 36.32 | 1.9260 | 7 23 18.5 | 15.052 | 16 | 2 25 55.37 | 2.2021 | 18 41 32.9 | 12.686 |
| 17 | 0 49 31.99 | 1.9298 | 7 38 21.0 | 15.032 | 17 | 2 28 7.73 | 2.2098 | 18 54 11.5 | 12.601 |
| 18 | 0 51 27.89 | 1.9336 | 7 53 22.3 | 15.012 | 18 | 2 30 20.55 | 2.2175 | 19 6 45.0 | 12.514 |
| 19 | 0 53 24.02 | 1.9375 | 8 8 22.4 | 14.991 | 19 | 2 32 33.83 | 2.2253 | 19 19 13.2 | 12.426 |
| 20 | 0 55 20.39 | 1.9416 | 8 23 21.2 | 14.968 | 20 | 2 34 47.58 | 2.2331 | 19 31 36.1 | 12.336 |
| 21 | 0 57 17.01 | 1.9457 | 8 38 18.6 | 14.944 | 21 | 2 37 1.80 | 2.2410 | 19 43 53.5 | 12.244 |
| 22 | 0 59 13.88 | 1.9499 | 8 53 14.5 | 14.918 | 22 | 2 39 16.50 | 2.2489 | 19 56 5.4 | 12.151 |
| 23 | 1 1 11.00 | 1.9541 | N. 9 8 8.8 | 14.892 | 23 | 2 41 31.67 | 2.2568 | N.20 8 11.6 | 12.055 |
| | THURSDAY 10. | | | | | SATURDAY 12. | | | |
| 0 | 1 3 8.37 | 1.9584 | N. 9 23 1.6 | 14.866 | 0 | 2 43 47.32 | 2.2648 | N.20 20 12.0 | 11.958 |
| 1 | 1 5 6.01 | 1.9629 | 9 37 52.7 | 14.837 | 1 | 2 46 3.45 | 2.2729 | 20 32 6.6 | 11.860 |
| 2 | 1 7 3.92 | 1.9675 | 9 52 42.0 | 14.807 | 2 | 2 48 20.07 | 2.2811 | 20 43 55.2 | 11.759 |
| 3 | 1 9 2.11 | 1.9722 | 10 7 29.5 | 14.776 | 3 | 2 50 37.18 | 2.2892 | 20 55 37.7 | 11.657 |
| 4 | 1 11 0.58 | 1.9769 | 10 22 15.1 | 14.744 | 4 | 2 52 54.78 | 2.2974 | 21 7 14.0 | 11.553 |
| 5 | 1 12 59.34 | 1.9817 | 10 36 58.8 | 14.711 | 5 | 2 55 12.87 | 2.3056 | 21 18 44.1 | 11.448 |
| 6 | 1 14 58.39 | 1.9867 | 10 51 40.4 | 14.676 | 6 | 2 57 31.45 | 2.3138 | 21 30 7.8 | 11.341 |
| 7 | 1 16 57.74 | 1.9917 | 11 6 19.9 | 14.640 | 7 | 2 59 50.53 | 2.3221 | 21 41 25.0 | 11.232 |
| 8 | 1 18 57.39 | 1.9967 | 11 20 57.2 | 14.603 | 8 | 3 2 10.11 | 2.3305 | 21 52 35.6 | 11.120 |
| 9 | 1 20 57.34 | 2.0018 | 11 35 32.3 | 14.565 | 9 | 3 4 30.19 | 2.3389 | 22 3 39.4 | 11.007 |
| 10 | 1 22 57.60 | 2.0070 | 11 50 5.0 | 14.525 | 10 | 3 6 50.78 | 2.3473 | 22 14 36.4 | 10.892 |
| 11 | 1 24 58.18 | 2.0124 | 12 4 35.3 | 14.484 | 11 | 3 9 11.87 | 2.3557 | 22 25 26.5 | 10.776 |
| 12 | 1 26 59.09 | 2.0178 | 12 19 3.1 | 14.442 | 12 | 3 11 33.46 | 2.3641 | 22 36 9.5 | 10.657 |
| 13 | 1 29 0.32 | 2.0233 | 12 33 28.4 | 14.399 | 13 | 3 13 55.56 | 2.3726 | 22 46 45.4 | 10.537 |
| 14 | 1 31 1.88 | 2.0288 | 12 47 51.0 | 14.353 | 14 | 3 16 18.17 | 2.3810 | 22 57 14.0 | 10.415 |
| 15 | 1 33 3.78 | 2.0345 | 13 2 10.8 | 14.307 | 15 | 3 18 41.28 | 2.3894 | 23 7 35.2 | 10.292 |
| 16 | 1 35 6.02 | 2.0403 | 13 16 27.8 | 14.260 | 16 | 3 21 4.90 | 2.3979 | 23 17 49.0 | 10.167 |
| 17 | 1 37 8.61 | 2.0462 | 13 30 42.0 | 14.212 | 17 | 3 23 29.03 | 2.4064 | 23 27 55.2 | 10.038 |
| 18 | 1 39 11.56 | 2.0522 | 13 44 53.2 | 14.161 | 18 | 3 25 53.67 | 2.4149 | 23 37 53.6 | 9.908 |
| 19 | 1 41 14.87 | 2.0582 | 13 59 1.3 | 14.109 | 19 | 3 28 18.82 | 2.4233 | 23 47 44.2 | 9.777 |
| 20 | 1 43 18.54 | 2.0642 | 14 13 6.3 | 14.057 | 20 | 3 30 44.47 | 2.4318 | 23 57 26.9 | 9.644 |
| 21 | 1 45 22.57 | 2.0703 | 14 27 8.1 | 14.002 | 21 | 3 33 10.63 | 2.4403 | 24 7 1.5 | 9.508 |
| 22 | 1 47 26.97 | 2.0765 | 14 41 6.6 | 13.946 | 22 | 3 35 37.30 | 2.4488 | 24 16 27.9 | 9.372 |
| 23 | 1 49 31.75 | 2.0829 | 14 55 1.6 | 13.889 | 23 | 3 38 4.48 | 2.4572 | 24 25 46.1 | 9.233 |
| 24 | 1 51 36.92 | 2.0893 | N.15 8 53.2 | 13.831 | 24 | 3 40 32.16 | 2.4655 | N.24 34 55.9 | 9.092 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SUNDAY 13.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 3 40 32.16 | 2.4655 | N.24 34 55.9 | 9.092 |
| 1 | 3 43 0.34 | 2.4739 | 24 43 57.2 | 8.950 |
| 2 | 3 45 29.03 | 2.4823 | 24 52 49.9 | 8.806 |
| 3 | 3 47 58.22 | 2.4906 | 25 1 33.9 | 8.660 |
| 4 | 3 50 27.91 | 2.4989 | 25 10 9.1 | 8.512 |
| 5 | 3 52 58.09 | 2.5072 | 25 18 35.3 | 8.361 |
| 6 | 3 55 28.77 | 2.5154 | 25 26 52.4 | 8.208 |
| 7 | 3 57 59.94 | 2.5236 | 25 35 0.3 | 8.055 |
| 8 | 4 0 31.60 | 2.5317 | 25 42 59.0 | 7.900 |
| 9 | 4 3 3.74 | 2.5397 | 25 50 48.3 | 7.742 |
| 10 | 4 5 36.36 | 2.5477 | 25 58 28.1 | 7.584 |
| 11 | 4 8 9.46 | 2.5556 | 26 5 58.4 | 7.424 |
| 12 | 4 10 43.03 | 2.5634 | 26 13 19.0 | 7.261 |
| 13 | 4 13 17.07 | 2.5712 | 26 20 29.7 | 7.096 |
| 14 | 4 15 51.58 | 2.5790 | 26 27 30.5 | 6.930 |
| 15 | 4 18 26.55 | 2.5866 | 26 34 21.3 | 6.762 |
| 16 | 4 21 1.97 | 2.5940 | 26 41 2.0 | 6.592 |
| 17 | 4 23 37.83 | 2.6014 | 26 47 32.4 | 6.421 |
| 18 | 4 26 14.14 | 2.6088 | 26 53 52.5 | 6.248 |
| 19 | 4 28 50.89 | 2.6161 | 27 0 2.2 | 6.073 |
| 20 | 4 31 28.07 | 2.6232 | 27 6 1.3 | 5.897 |
| 21 | 4 34 5.67 | 2.6302 | 27 11 49.8 | 5.719 |
| 22 | 4 36 43.69 | 2.6371 | 27 17 27.6 | 5.539 |
| 23 | 4 39 22.12 | 2.6438 | N.27 22 54.5 | 5.357 |

### MONDAY 14.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 4 42 0.95 | 2.6505 | N.27 28 10.5 | 5.175 |
| 1 | 4 44 40.18 | 2.6571 | 27 33 15.5 | 4.991 |
| 2 | 4 47 19.80 | 2.6635 | 27 38 9.4 | 4.806 |
| 3 | 4 49 59.80 | 2.6697 | 27 42 52.2 | 4.619 |
| 4 | 4 52 40.17 | 2.6758 | 27 47 23.7 | 4.430 |
| 5 | 4 55 20.90 | 2.6818 | 27 51 43.8 | 4.239 |
| 6 | 4 58 1.99 | 2.6877 | 27 55 52.4 | 4.047 |
| 7 | 5 0 43.43 | 2.6934 | 27 59 49.5 | 3.855 |
| 8 | 5 3 25.20 | 2.6989 | 28 3 35.0 | 3.662 |
| 9 | 5 6 7.30 | 2.7043 | 28 7 8.9 | 3.467 |
| 10 | 5 8 49.72 | 2.7095 | 28 10 31.0 | 3.269 |
| 11 | 5 11 32.44 | 2.7145 | 28 13 41.2 | 3.071 |
| 12 | 5 14 15.46 | 2.7194 | 28 16 39.5 | 2.872 |
| 13 | 5 16 58.77 | 2.7242 | 28 19 25.9 | 2.672 |
| 14 | 5 19 42.36 | 2.7287 | 28 22 0.2 | 2.471 |
| 15 | 5 22 26.21 | 2.7329 | 28 24 22.4 | 2.268 |
| 16 | 5 25 10.31 | 2.7371 | 28 26 32.4 | 2.065 |
| 17 | 5 27 54.66 | 2.7412 | 28 28 30.2 | 1.862 |
| 18 | 5 30 39.25 | 2.7450 | 28 30 15.8 | 1.657 |
| 19 | 5 33 24.06 | 2.7485 | 28 31 49.0 | 1.450 |
| 20 | 5 36 9.07 | 2.7518 | 28 33 9.8 | 1.243 |
| 21 | 5 38 54.28 | 2.7551 | 28 34 18.2 | 1.036 |
| 22 | 5 41 39.68 | 2.7581 | 28 35 14.1 | 0.827 |
| 23 | 5 44 25.25 | 2.7608 | 28 35 57.5 | 0.618 |
| 24 | 5 47 10.98 | 2.7634 | N.28 36 28.3 | 0.408 |

### TUESDAY 15.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 5 47 10.98 | 2.7634 | N.28 36 28.3 | 0.408 |
| 1 | 5 49 56.86 | 2.7658 | 28 36 46.5 | +0.198 |
| 2 | 5 52 42.88 | 2.7681 | 28 36 52.1 | −0.012 |
| 3 | 5 55 29.03 | 2.7701 | 28 36 45.1 | 0.223 |
| 4 | 5 58 15.29 | 2.7718 | 28 36 25.4 | 0.435 |
| 5 | 6 1 1.64 | 2.7733 | 28 35 52.9 | 0.647 |
| 6 | 6 3 48.08 | 2.7746 | 28 35 7.7 | 0.859 |
| 7 | 6 6 34.59 | 2.7757 | 28 34 9.8 | 1.072 |
| 8 | 6 9 21.17 | 2.7767 | 28 32 59.1 | 1.284 |
| 9 | 6 12 7.80 | 2.7774 | 28 31 35.7 | 1.497 |
| 10 | 6 14 54.46 | 2.7778 | 28 29 59.5 | 1.710 |
| 11 | 6 17 41.14 | 2.7782 | 28 28 10.5 | 1.923 |
| 12 | 6 20 27.84 | 2.7782 | 28 26 8.7 | 2.137 |
| 13 | 6 23 14.53 | 2.7780 | 28 23 54.1 | 2.350 |
| 14 | 6 26 1.20 | 2.7777 | 28 21 26.7 | 2.562 |
| 15 | 6 28 47.85 | 2.7772 | 28 18 46.6 | 2.775 |
| 16 | 6 31 34.46 | 2.7763 | 28 15 53.7 | 2.987 |
| 17 | 6 34 21.01 | 2.7753 | 28 12 48.1 | 3.199 |
| 18 | 6 37 7.50 | 2.7742 | 28 9 29.8 | 3.411 |
| 19 | 6 39 53.91 | 2.7728 | 28 5 58.8 | 3.622 |
| 20 | 6 42 40.23 | 2.7711 | 28 2 15.1 | 3.834 |
| 21 | 6 45 26.44 | 2.7692 | 27 58 18.7 | 4.045 |
| 22 | 6 48 12.54 | 2.7672 | 27 54 9.7 | 4.255 |
| 23 | 6 50 58.51 | 2.7650 | N.27 49 48.1 | 4.464 |

### WEDNESDAY 16

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 6 53 44.34 | 2.7626 | N.27 45 14.0 | 4.673 |
| 1 | 6 56 30.02 | 2.7599 | 27 40 27.4 | 4.881 |
| 2 | 6 59 15.53 | 2.7571 | 27 35 28.3 | 5.088 |
| 3 | 7 2 0.87 | 2.7541 | 27 30 16.8 | 5.295 |
| 4 | 7 4 46.02 | 2.7508 | 27 24 52.9 | 5.501 |
| 5 | 7 7 30.97 | 2.7475 | 27 19 16.7 | 5.705 |
| 6 | 7 10 15.72 | 2.7440 | 27 13 28.3 | 5.908 |
| 7 | 7 13 0.25 | 2.7402 | 27 7 27.7 | 6.112 |
| 8 | 7 15 44.55 | 2.7362 | 27 1 14.9 | 6.314 |
| 9 | 7 18 28.60 | 2.7321 | 26 54 50.0 | 6.514 |
| 10 | 7 21 12.40 | 2.7279 | 26 48 13.2 | 6.712 |
| 11 | 7 23 55.95 | 2.7236 | 26 41 24.5 | 6.910 |
| 12 | 7 26 39.23 | 2.7190 | 26 34 24.0 | 7.107 |
| 13 | 7 29 22.23 | 2.7142 | 26 27 11.7 | 7.303 |
| 14 | 7 32 4.94 | 2.7093 | 26 19 47.6 | 7.498 |
| 15 | 7 34 47.35 | 2.7043 | 26 12 11.9 | 7.691 |
| 16 | 7 37 29.45 | 2.6991 | 26 4 24.7 | 7.882 |
| 17 | 7 40 11.24 | 2.6938 | 25 56 26.0 | 8.072 |
| 18 | 7 42 52.70 | 2.6883 | 25 48 16.0 | 8.261 |
| 19 | 7 45 33.83 | 2.6827 | 25 39 54.7 | 8.448 |
| 20 | 7 48 14.62 | 2.6770 | 25 31 22.3 | 8.633 |
| 21 | 7 50 55.07 | 2.6712 | 25 22 38.8 | 8.817 |
| 22 | 7 53 35.16 | 2.6652 | 25 13 44.3 | 8.998 |
| 23 | 7 56 14.89 | 2.6591 | 25 4 39.0 | 9.178 |
| 24 | 7 58 54.25 | 2.6529 | N.24 55 22.9 | 9.357 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | THURSDAY 17. | | | | | SATURDAY 19. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 7 58 54.25 | 2.6529 | N.24 55 22.9 | 9.357 | 0 | 9 58 0.69 | 2.3059 | N.14 38 28.9 | 15.517 |
| 1 | 8 1 33.24 | 2.6466 | 24 45 56.1 | 9.534 | 1 | 10 0 18.84 | 2.2991 | 14 22 55.6 | 15.592 |
| 2 | 8 4 11.84 | 2.6401 | 24 36 18.8 | 9.709 | 2 | 10 2 36.58 | 2.2924 | 14 7 17.9 | 15.663 |
| 3 | 8 6 50.05 | 2.6336 | 24 26 31.0 | 9.883 | 3 | 10 4 53.92 | 2.2857 | 13 51 36.0 | 15.733 |
| 4 | 8 9 27.87 | 2.6271 | 24 16 32.8 | 10.055 | 4 | 10 7 10.86 | 2.2790 | 13 35 50.0 | 15.801 |
| 5 | 8 12 5.30 | 2.6204 | 24 6 24.4 | 10.224 | 5 | 10 9 27.40 | 2.2723 | 13 19 59.9 | 15.868 |
| 6 | 8 14 42.32 | 2.6136 | 23 56 5.9 | 10.392 | 6 | 10 11 43.54 | 2.2658 | 13 4 5.9 | 15.932 |
| 7 | 8 17 18.93 | 2.6067 | 23 45 37.4 | 10.558 | 7 | 10 13 59.30 | 2.2594 | 12 48 8.1 | 15.993 |
| 8 | 8 19 55.13 | 2.5998 | 23 34 59.0 | 10.722 | 8 | 10 16 14.67 | 2.2530 | 12 32 6.7 | 16.053 |
| 9 | 8 22 30.91 | 2.5928 | 23 24 10.8 | 10.883 | 9 | 10 18 29.66 | 2.2467 | 12 16 1.7 | 16.112 |
| 10 | 8 25 6.27 | 2.5858 | 23 13 13.0 | 11.043 | 10 | 10 20 44.27 | 2.2404 | 11 59 53.3 | 16.167 |
| 11 | 8 27 41.20 | 2.5787 | 23 2 5.7 | 11.201 | 11 | 10 22 58.51 | 2.2342 | 11 43 41.7 | 16.219 |
| 12 | 8 30 15.71 | 2.5716 | 22 50 48.9 | 11.357 | 12 | 10 25 12.38 | 2.2282 | 11 27 27.0 | 16.271 |
| 13 | 8 32 49.79 | 2.5643 | 22 39 22.8 | 11.511 | 13 | 10 27 25.89 | 2.2222 | 11 11 9.2 | 16.321 |
| 14 | 8 35 23.43 | 2.5569 | 22 27 47.6 | 11.662 | 14 | 10 29 39.04 | 2.2162 | 10 54 48.5 | 16.368 |
| 15 | 8 37 56.62 | 2.5495 | 22 16 3.4 | 11.811 | 15 | 10 31 51.83 | 2.2103 | 10 38 25.1 | 16.413 |
| 16 | 8 40 29.37 | 2.5422 | 22 4 10.3 | 11.959 | 16 | 10 34 4.28 | 2.2046 | 10 21 59.0 | 16.457 |
| 17 | 8 43 1.68 | 2.5348 | 21 52 8.3 | 12.106 | 17 | 10 36 16.38 | 2.1989 | 10 5 30.3 | 16.498 |
| 18 | 8 45 33.55 | 2.5274 | 21 39 57.6 | 12.249 | 18 | 10 38 28.14 | 2.1932 | 9 48 59.2 | 16.537 |
| 19 | 8 48 4.97 | 2.5199 | 21 27 38.4 | 12.390 | 19 | 10 40 39.56 | 2.1876 | 9 32 25.8 | 16.575 |
| 20 | 8 50 35.94 | 2.5124 | 21 15 10.8 | 12.528 | 20 | 10 42 50.65 | 2.1822 | 9 15 50.2 | 16.610 |
| 21 | 8 53 6.46 | 2.5048 | 21 2 35.0 | 12.664 | 21 | 10 45 1.42 | 2.1768 | 8 59 12.6 | 16.643 |
| 22 | 8 55 36.52 | 2.4972 | 20 49 51.1 | 12.798 | 22 | 10 47 11.87 | 2.1715 | 8 42 33.0 | 16.676 |
| 23 | 8 58 6.13 | 2.4897 | N.20 36 59.2 | 12.931 | 23 | 10 49 22.00 | 2.1663 | N. 8 25 51.5 | 16.706 |
| | FRIDAY 18. | | | | | SUNDAY 20. | | | |
| 0 | 9 0 35.29 | 2.4822 | N.20 23 59.4 | 13.062 | 0 | 10 51 31.82 | 2.1612 | N. 8 9 8.3 | 16.733 |
| 1 | 9 3 3.99 | 2.4746 | 20 10 51.8 | 13.190 | 1 | 10 53 41.34 | 2.1561 | 7 52 23.5 | 16.759 |
| 2 | 9 5 32.24 | 2.4671 | 19 57 36.6 | 13.315 | 2 | 10 55 50.55 | 2.1510 | 7 35 37.2 | 16.783 |
| 3 | 9 8 0.04 | 2.4595 | 19 44 14.0 | 13.438 | 3 | 10 57 59.46 | 2.1461 | 7 18 49.5 | 16.806 |
| 4 | 9 10 27.38 | 2.4519 | 19 30 44.0 | 13.560 | 4 | 11 0 8.08 | 2.1413 | 7 2 0.5 | 16.827 |
| 5 | 9 12 54.27 | 2.4444 | 19 17 6.8 | 13.678 | 5 | 11 2 16.42 | 2.1367 | 6 45 10.3 | 16.845 |
| 6 | 9 15 20.71 | 2.4369 | 19 3 22.6 | 13.794 | 6 | 11 4 24.48 | 2.1320 | 6 28 19.1 | 16.862 |
| 7 | 9 17 46.70 | 2.4293 | 18 49 31.5 | 13.909 | 7 | 11 6 32.26 | 2.1274 | 6 11 26.9 | 16.877 |
| 8 | 9 20 12.23 | 2.4217 | 18 35 33.5 | 14.022 | 8 | 11 8 39.77 | 2.1230 | 5 54 33.9 | 16.890 |
| 9 | 9 22 37.31 | 2.4142 | 18 21 28.8 | 14.133 | 9 | 11 10 47.02 | 2.1187 | 5 37 40.1 | 16.902 |
| 10 | 9 25 1.94 | 2.4067 | 18 7 17.5 | 14.242 | 10 | 11 12 54.01 | 2.1144 | 5 20 45.6 | 16.912 |
| 11 | 9 27 26.12 | 2.3993 | 17 52 59.8 | 14.347 | 11 | 11 15 0.75 | 2.1102 | 5 3 50.6 | 16.920 |
| 12 | 9 29 49.86 | 2.3919 | 17 38 35.9 | 14.450 | 12 | 11 17 7.23 | 2.1060 | 4 46 55.2 | 16.927 |
| 13 | 9 32 13.15 | 2.3845 | 17 24 5.8 | 14.552 | 13 | 11 19 13.47 | 2.1020 | 4 29 59.4 | 16.932 |
| 14 | 9 34 36.00 | 2.3772 | 17 9 29.7 | 14.650 | 14 | 11 21 19.47 | 2.0981 | 4 13 3.4 | 16.934 |
| 15 | 9 36 58.41 | 2.3699 | 16 54 47.8 | 14.746 | 15 | 11 23 25.24 | 2.0943 | 3 56 7.3 | 16.935 |
| 16 | 9 39 20.38 | 2.3626 | 16 40 0.2 | 14.840 | 16 | 11 25 30.78 | 2.0905 | 3 39 11.2 | 16.935 |
| 17 | 9 41 41.92 | 2.3553 | 16 25 7.0 | 14.932 | 17 | 11 27 36.10 | 2.0868 | 3 22 15.1 | 16.934 |
| 18 | 9 44 3.02 | 2.3481 | 16 10 8.4 | 15.021 | 18 | 11 29 41.20 | 2.0832 | 3 5 19.1 | 16.931 |
| 19 | 9 46 23.69 | 2.3409 | 15 55 4.5 | 15.109 | 19 | 11 31 46.09 | 2.0797 | 2 48 23.4 | 16.925 |
| 20 | 9 48 43.93 | 2.3338 | 15 39 55.3 | 15.196 | 20 | 11 33 50.77 | 2.0763 | 2 31 28.1 | 16.918 |
| 21 | 9 51 3.75 | 2.3268 | 15 24 41.0 | 15.280 | 21 | 11 35 55.25 | 2.0731 | 2 14 33.2 | 16.911 |
| 22 | 9 53 23.15 | 2.3198 | 15 9 21.7 | 15.362 | 22 | 11 37 59.54 | 2.0699 | 1 57 38.8 | 16.901 |
| 23 | 9 55 42.13 | 2.3128 | 14 53 57.6 | 15.440 | 23 | 11 40 3.63 | 2.0667 | 1 40 45.1 | 16.889 |
| 24 | 9 58 0.69 | 2.3059 | N.14 38 28.9 | 15.517 | 24 | 11 42 7.54 | 2.0637 | N. 1 23 52.1 | 16.877 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | MONDAY 21. | | | | | WEDNESDAY 23. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 11 42 7.54 | 2.0637 | N. 1 23 52.1 | 16.877 | 0 | 13 19 15.55 | 2.0139 | S. 11 25 45.3 | 14.729 |
| 1 | 11 44 11.27 | 2.0607 | 1 6 59.9 | 16.863 | 1 | 13 21 16.41 | 2.0147 | 11 40 26.9 | 14.657 |
| 2 | 11 46 14.82 | 2.0578 | 0 50 8.6 | 16.847 | 2 | 13 23 17.31 | 2.0154 | 11 55 4.2 | 14.585 |
| 3 | 11 48 18.20 | 2.0550 | 0 33 18.3 | 16.829 | 3 | 13 25 18.26 | 2.0163 | 12 9 37.1 | 14.511 |
| 4 | 11 50 21.42 | 2.0523 | N. 0 16 29.1 | 16.811 | 4 | 13 27 19.27 | 2.0173 | 12 24 5.5 | 14.436 |
| 5 | 11 52 24.48 | 2.0497 | S. 0 0 19.0 | 16.791 | 5 | 13 29 20.34 | 2.0184 | 12 38 29.4 | 14.361 |
| 6 | 11 54 27.38 | 2.0471 | 0 17 5.8 | 16.769 | 6 | 13 31 21.48 | 2.0196 | 12 52 48.8 | 14.284 |
| 7 | 11 56 30.13 | 2.0447 | 0 33 51.3 | 16.746 | 7 | 13 33 22.69 | 2.0207 | 13 7 3.5 | 14.206 |
| 8 | 11 58 32.74 | 2.0423 | 0 50 35.3 | 16.721 | 8 | 13 35 23.96 | 2.0218 | 13 21 13.5 | 14.127 |
| 9 | 12 0 35.21 | 2.0400 | 1 7 17.8 | 16.695 | 9 | 13 37 25.30 | 2.0230 | 13 35 18.8 | 14.048 |
| 10 | 12 2 37.54 | 2.0378 | 1 23 58.7 | 16.667 | 10 | 13 39 26.72 | 2.0244 | 13 49 19.3 | 13.968 |
| 11 | 12 4 39.75 | 2.0358 | 1 40 37.9 | 16.639 | 11 | 13 41 28.23 | 2.0258 | 14 3 15.0 | 13.887 |
| 12 | 12 6 41.84 | 2.0338 | 1 57 15.4 | 16.609 | 12 | 13 43 29.82 | 2.0272 | 14 17 5.8 | 13.805 |
| 13 | 12 8 43.81 | 2.0318 | 2 13 51.0 | 16.577 | 13 | 13 45 31.50 | 2.0287 | 14 30 51.6 | 13.722 |
| 14 | 12 10 45.66 | 2.0299 | 2 30 24.7 | 16.545 | 14 | 13 47 33.27 | 2.0302 | 14 44 32.4 | 13.638 |
| 15 | 12 12 47.40 | 2.0282 | 2 46 56.4 | 16.511 | 15 | 13 49 35.13 | 2.0318 | 14 58 8.2 | 13.554 |
| 16 | 12 14 49.04 | 2.0266 | 3 3 26.0 | 16.476 | 16 | 13 51 37.09 | 2.0335 | 15 11 38.9 | 13.468 |
| 17 | 12 16 50.59 | 2.0250 | 3 19 53.5 | 16.440 | 17 | 13 53 39.15 | 2.0352 | 15 25 4.4 | 13.382 |
| 18 | 12 18 52.04 | 2.0234 | 3 36 18.8 | 16.402 | 18 | 13 55 41.32 | 2.0370 | 15 38 24.7 | 13.294 |
| 19 | 12 20 53.40 | 2.0220 | 3 52 41.8 | 16.363 | 19 | 13 57 43.59 | 2.0388 | 15 51 39.7 | 13.206 |
| 20 | 12 22 54.68 | 2.0207 | 4 9 2.4 | 16.322 | 20 | 13 59 45.97 | 2.0406 | 16 4 49.4 | 13.117 |
| 21 | 12 24 55.88 | 2.0194 | 4 25 20.5 | 16.280 | 21 | 14 1 48.46 | 2.0425 | 16 17 53.8 | 13.028 |
| 22 | 12 26 57.01 | 2.0182 | 4 41 36.0 | 16.237 | 22 | 14 3 51.07 | 2.0445 | 16 30 52.8 | 12.937 |
| 23 | 12 28 58.06 | 2.0170 | S. 4 57 48.9 | 16.193 | 23 | 14 5 53.80 | 2.0465 | S. 16 43 46.3 | 12.846 |
| | TUESDAY 22. | | | | | THURSDAY 24. | | | |
| 0 | 12 30 59.05 | 2.0160 | S. 5 13 59.2 | 16.148 | 0 | 14 7 56.65 | 2.0485 | S. 16 56 34.3 | 12.753 |
| 1 | 12 32 59.98 | 2.0151 | 5 30 6.7 | 16.102 | 1 | 14 9 59.62 | 2.0506 | 17 9 16.7 | 12.660 |
| 2 | 12 35 0.86 | 2.0143 | 5 46 11.4 | 16.054 | 2 | 14 12 2.72 | 2.0527 | 17 21 53.5 | 12.567 |
| 3 | 12 37 1.69 | 2.0135 | 6 2 13.2 | 16.006 | 3 | 14 14 5.94 | 2.0548 | 17 34 24.7 | 12.473 |
| 4 | 12 39 2.48 | 2.0127 | 6 18 12.1 | 15.956 | 4 | 14 16 9.29 | 2.0569 | 17 46 50.3 | 12.378 |
| 5 | 12 41 3.22 | 2.0120 | 6 34 7.9 | 15.904 | 5 | 14 18 12.77 | 2.0592 | 17 59 10.1 | 12.282 |
| 6 | 12 43 3.92 | 2.0114 | 6 50 0.6 | 15.852 | 6 | 14 20 16.39 | 2.0615 | 18 11 24.1 | 12.184 |
| 7 | 12 45 4.59 | 2.0110 | 7 5 50.2 | 15.799 | 7 | 14 22 20.15 | 2.0638 | 18 23 32.2 | 12.086 |
| 8 | 12 47 5.24 | 2.0107 | 7 21 36.5 | 15.744 | 8 | 14 24 24.05 | 2.0662 | 18 35 34.4 | 11.987 |
| 9 | 12 49 5.87 | 2.0103 | 7 37 19.5 | 15.689 | 9 | 14 26 28.09 | 2.0685 | 18 47 30.7 | 11.888 |
| 10 | 12 51 6.48 | 2.0100 | 7 52 59.2 | 15.632 | 10 | 14 28 32.27 | 2.0709 | 18 59 21.0 | 11.789 |
| 11 | 12 53 7.07 | 2.0098 | 8 8 35.4 | 15.574 | 11 | 14 30 36.60 | 2.0733 | 19 11 5.4 | 11.689 |
| 12 | 12 55 7.66 | 2.0098 | 8 24 8.1 | 15.516 | 12 | 14 32 41.07 | 2.0757 | 19 22 43.7 | 11.587 |
| 13 | 12 57 8.25 | 2.0097 | 8 39 37.3 | 15.457 | 13 | 14 34 45.69 | 2.0782 | 19 34 15.8 | 11.484 |
| 14 | 12 59 8.83 | 2.0097 | 8 55 2.9 | 15.396 | 14 | 14 36 50.46 | 2.0808 | 19 45 41.8 | 11.382 |
| 15 | 13 1 9.42 | 2.0098 | 9 10 24.8 | 15.333 | 15 | 14 38 55.39 | 2.0834 | 19 57 1.6 | 11.278 |
| 16 | 13 3 10.01 | 2.0099 | 9 25 42.9 | 15.269 | 16 | 14 41 0.47 | 2.0860 | 20 8 15.2 | 11.174 |
| 17 | 13 5 10.61 | 2.0102 | 9 40 57.1 | 15.205 | 17 | 14 43 5.71 | 2.0886 | 20 19 22.5 | 11.068 |
| 18 | 13 7 11.23 | 2.0105 | 9 56 7.5 | 15.141 | 18 | 14 45 11.10 | 2.0912 | 20 30 23.4 | 10.962 |
| 19 | 13 9 11.87 | 2.0109 | 10 11 14.0 | 15.075 | 19 | 14 47 16.65 | 2.0938 | 20 41 17.9 | 10.856 |
| 20 | 13 11 12.54 | 2.0114 | 10 26 16.5 | 15.007 | 20 | 14 49 22.36 | 2.0965 | 20 52 6.1 | 10.749 |
| 21 | 13 13 13.24 | 2.0119 | 10 41 14.9 | 14.939 | 21 | 14 51 28.23 | 2.0992 | 21 2 47.8 | 10.641 |
| 22 | 13 15 13.97 | 2.0125 | 10 56 9.2 | 14.871 | 22 | 14 53 34.26 | 2.1019 | 21 13 23.0 | 10.532 |
| 23 | 13 17 14.74 | 2.0132 | 11 10 59.4 | 14.801 | 23 | 14 55 40.45 | 2.1046 | 21 23 51.6 | 10.423 |
| 24 | 13 19 15.55 | 2.0139 | S. 11 25 45.3 | 14.729 | 24 | 14 57 46.81 | 2.1073 | S. 21 34 13.7 | 10.313 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | FRIDAY 25. | | | | | SUNDAY 27. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 14 57 46.81 | 2.1073 | S.21 34 13.7 | 10.313 | 0 | 16 42 0.65 | 2.2273 | S.27 30 47.8 | 4.343 |
| 1 | 14 59 53.33 | 2.1101 | 21 44 29.2 | 10.202 | 1 | 16 44 14.34 | 2.2289 | 27 35 4.3 | 4.207 |
| 2 | 15 2 0.02 | 2.1128 | 21 54 38.0 | 10.090 | 2 | 16 46 28.12 | 2.2305 | 27 39 12.6 | 4.070 |
| 3 | 15 4 6.87 | 2.1156 | 22 4 40.0 | 9.977 | 3 | 16 48 42.00 | 2.2322 | 27 43 12.7 | 3.934 |
| 4 | 15 6 13.89 | 2.1183 | 22 14 35.3 | 9.865 | 4 | 16 50 55.98 | 2.2338 | 27 47 4.7 | 3.798 |
| 5 | 15 8 21.07 | 2.1211 | 22 24 23.8 | 9.752 | 5 | 16 53 10.05 | 2.2352 | 27 50 48.5 | 3.661 |
| 6 | 15 10 28.42 | 2.1239 | 22 34 5.5 | 9.638 | 6 | 16 55 24.20 | 2.2365 | 27 54 24.0 | 3.524 |
| 7 | 15 12 35.94 | 2.1268 | 22 43 40.3 | 9.523 | 7 | 16 57 38.43 | 2.2378 | 27 57 51.3 | 3.387 |
| 8 | 15 14 43.63 | 2.1296 | 22 53 8.2 | 9.408 | 8 | 16 59 52.74 | 2.2391 | 28 1 10.4 | 3.249 |
| 9 | 15 16 51.49 | 2.1323 | 23 2 29.2 | 9.292 | 9 | 17 2 7.12 | 2.2403 | 28 4 21.2 | 3.111 |
| 10 | 15 18 59.51 | 2.1351 | 23 11 43.2 | 9.175 | 10 | 17 4 21.57 | 2.2414 | 28 7 23.7 | 2.973 |
| 11 | 15 21 7.70 | 2.1379 | 23 20 50.2 | 9.058 | 11 | 17 6 36.09 | 2.2425 | 28 10 18.0 | 2.836 |
| 12 | 15 23 16.06 | 2.1408 | 23 29 50.2 | 8.941 | 12 | 17 8 50.67 | 2.2435 | 28 13 4.0 | 2.698 |
| 13 | 15 25 24.59 | 2.1436 | 23 38 43.1 | 8.822 | 13 | 17 11 5.31 | 2.2445 | 28 15 41.7 | 2.559 |
| 14 | 15 27 33.29 | 2.1463 | 23 47 28.8 | 8.702 | 14 | 17 13 20.01 | 2.2454 | 28 18 11.1 | 2.420 |
| 15 | 15 29 42.15 | 2.1491 | 23 56 7.3 | 8.582 | 15 | 17 15 34.76 | 2.2462 | 28 20 32.1 | 2.281 |
| 16 | 15 31 51.18 | 2.1518 | 24 4 38.6 | 8.462 | 16 | 17 17 49.55 | 2.2468 | 28 22 44.8 | 2.142 |
| 17 | 15 34 0.37 | 2.1546 | 24 13 2.7 | 8.342 | 17 | 17 20 4.38 | 2.2475 | 28 24 49.2 | 2.003 |
| 18 | 15 36 9.73 | 2.1573 | 24 21 19.6 | 8.221 | 18 | 17 22 19.25 | 2.2481 | 28 26 45.2 | 1,864 |
| 19 | 15 38 19.25 | 2.1601 | 24 29 29.2 | 8.098 | 19 | 17 24 34.15 | 2.2487 | 28 28 32.9 | 1.725 |
| 20 | 15 40 28.94 | 2.1629 | 24 37 31.4 | 7.975 | 20 | 17 26 49.09 | 2.2492 | 28 30 12.2 | 1.586 |
| 21 | 15 42 38.80 | 2.1657 | 24 45 26.2 | 7.852 | 21 | 17 29 4.05 | 2.2495 | 28 31 43.2 | 1.447 |
| 22 | 15 44 48.82 | 2.1683 | 24 53 13.6 | 7.728 | 22 | 17 31 19.03 | 2.2499 | 28 33 5.8 | 1.307 |
| 23 | 15 46 58.99 | 2.1709 | S.25 0 53.6 | 7.604 | 23 | 17 33 34.03 | 2.2502 | S.28 34 20.0 | 1.167 |
| | SATURDAY 26. | | | | | MONDAY 28. | | | |
| 0 | 15 49 9.32 | 2.1735 | S.25 8 26.1 | 7.479 | 0 | 17 35 49.05 | 2.2504 | S.28 35 25.9 | 1.028 |
| 1 | 15 51 19.81 | 2.1762 | 25 15 51.1 | 7.354 | 1 | 17 38 4.08 | 2.2504 | 28 36 23.4 | 0.888 |
| 2 | 15 53 30.46 | 2.1788 | 25 23 8.6 | 7.228 | 2 | 17 40 19.10 | 2.2503 | 28 37 12.5 | 0.748 |
| 3 | 15 55 41.27 | 2.1814 | 25 30 18.5 | 7.102 | 3 | 17 42 34.12 | 2.2503 | 28 37 53.2 | 0.609 |
| 4 | 15 57 52.23 | 2.1839 | 25 37 20.8 | 6.975 | 4 | 17 44 49.13 | 2.2502 | 28 38 25.6 | 0.470 |
| 5 | 16 0 3.34 | 2.1864 | 25 44 15.5 | 6.847 | 5 | 17 47 4.14 | 2.2500 | 28 38 49.6 | 0.330 |
| 6 | 16 2 14.60 | 2.1889 | 25 51 2.5 | 6.719 | 6 | 17 49 19.13 | 2.2497 | 28 39 5.2 | 0.191 |
| 7 | 16 4 26.01 | 2.1914 | 25 57 41.8 | 6.591 | 7 | 17 51 34.10 | 2.2494 | 28 39 12.5 | −0.052 |
| 8 | 16 6 37.57 | 2.1939 | 26 4 13.4 | 6.462 | 8 | 17 53 49.05 | 2.2490 | 28 39 11.4 | +0.088 |
| 9 | 16 8 49.28 | 2.1963 | 26 10 37.3 | 6.333 | 9 | 17 56 3.98 | 2.2485 | 28 39 1.9 | 0.227 |
| 10 | 16 11 1.13 | 2.1986 | 26 16 53.4 | 6.203 | 10 | 17 58 18.87 | 2.2479 | 28 38 44.1 | 0.367 |
| 11 | 16 13 13.12 | 2.2009 | 26 23 1.7 | 6.072 | 11 | 18 0 33.72 | 2.2472 | 28 38 17.9 | 0.506 |
| 12 | 16 15 25.24 | 2.2032 | 26 20 2.1 | 5.942 | 12 | 18 2 48.53 | 2.2465 | 28 37 43.4 | 0.644 |
| 13 | 16 17 37.50 | 2.2055 | 26 34 54.7 | 5.811 | 13 | 18 5 3.30 | 2.2457 | 28 37 0.6 | 0.783 |
| 14 | 16 19 49.90 | 2.2077 | 26 40 39.4 | 5.679 | 14 | 18 7 18.02 | 2.2448 | 28 36 9.4 | 0.922 |
| 15 | 16 22 2.43 | 2.2099 | 26 46 16.2 | 5.548 | 15 | 18 9 32.68 | 2.2438 | 28 35 9.9 | 1.061 |
| 16 | 16 24 15.00 | 2.2120 | 26 51 45.1 | 5.416 | 16 | 18 11 47.28 | 2.2428 | 28 34 2.1 | 1.199 |
| 17 | 16 26 27.87 | 2.2141 | 26 57 6.1 | 5.282 | 17 | 18 14 1.82 | 2.2418 | 28 32 46.0 | 1.338 |
| 18 | 16 28 40.78 | 2.2162 | 27 2 19.0 | 5.148 | 18 | 18 16 16.30 | 2.2407 | 28 31 21.6 | 1.476 |
| 19 | 16 30 53.81 | 2.2181 | 27 7 23.9 | 5.015 | 19 | 18 18 30.71 | 2.2395 | 28 29 48.9 | 1.613 |
| 20 | 16 33 6.95 | 2.2200 | 27 12 20.8 | 4.882 | 20 | 18 20 45.04 | 2.2382 | 28 28 8.0 | 1.750 |
| 21 | 16 35 20.21 | 2.2219 | 27 17 9.7 | 4.748 | 21 | 18 22 59.29 | 2.2368 | 28 26 18.9 | 1.887 |
| 22 | 16 37 33.58 | 2.2238 | 27 21 50.5 | 4.613 | 22 | 18 25 13.46 | 2.2354 | 28 24 21.6 | 2.024 |
| 23 | 16 39 47.06 | 2.2256 | 27 26 23.2 | 4.478 | 23 | 18 27 27.54 | 2.2338 | 28 22 16.0 | 2.161 |
| 24 | 16 42 0.65 | 2.2273 | S.27 30 47.8 | 4.343 | 24 | 18 29 41.52 | 2.2322 | S.28 20 2.2 | 2.298 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION

### TUESDAY 29.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 18 29 41.52 | 2.2322 | S.28 20 2.2 | 2.298 |
| 1 | 18 31 55.41 | 2.2306 | 28 17 40.2 | 2.434 |
| 2 | 18 34 9.20 | 2.2289 | 28 15 10.1 | 2.569 |
| 3 | 18 36 22.88 | 2.2271 | 28 12 31.9 | 2.705 |
| 4 | 18 38 36.45 | 2.2252 | 28 9 45.5 | 2.841 |
| 5 | 18 40 49.91 | 2.2234 | 28 6 51.0 | 2.976 |
| 6 | 18 43 3.26 | 2.2215 | 28 3 48.4 | 3.110 |
| 7 | 18 45 16.49 | 2.2194 | 28 0 37.8 | 3.244 |
| 8 | 18 47 29.59 | 2.2173 | 27 57 19.1 | 3.378 |
| 9 | 18 49 42.56 | 2.2151 | 27 53 52.4 | 3.511 |
| 10 | 18 51 55.40 | 2.2128 | 27 50 17.8 | 3.644 |
| 11 | 18 54 8.10 | 2.2106 | 27 46 35.2 | 3.777 |
| 12 | 18 56 20.67 | 2.2082 | 27 42 44.6 | 3.909 |
| 13 | 18 58 33.09 | 2.2058 | 27 38 46.1 | 4.041 |
| 14 | 19 0 45.37 | 2.2034 | 27 34 39.7 | 4.172 |
| 15 | 19 2 57.50 | 2.2009 | 27 30 25.5 | 4.302 |
| 16 | 19 5 9.48 | 2.1983 | 27 26 3.4 | 4.433 |
| 17 | 19 7 21.30 | 2.1958 | 27 21 33.5 | 4.563 |
| 18 | 19 9 32.97 | 2.1932 | 27 16 55.8 | 4.693 |
| 19 | 19 11 44.48 | 2.1904 | 27 12 10.4 | 4.822 |
| 20 | 19 13 55.82 | 2.1876 | 27 7 17.2 | 4.950 |
| 21 | 19 16 6.99 | 2.1847 | 27 2 16.4 | 5.077 |
| 22 | 19 18 17.99 | 2.1819 | 26 57 8.0 | 5.204 |
| 23 | 19 20 28.82 | 2.1790 | S.26 51 51.9 | 5.332 |

### WEDNESDAY 30.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 19 22 39.47 | 2.1760 | S.26 46 28.2 | 5.458 |
| 1 | 19 24 49.94 | 2.1730 | 26 40 56.9 | 5.584 |
| 2 | 19 27 0.23 | 2.1700 | 26 35 18.1 | 5.708 |
| 3 | 19 29 10.34 | 2.1669 | 26 29 31.9 | 5.832 |
| 4 | 19 31 20.26 | 2.1638 | 26 23 38.2 | 5.957 |
| 5 | 19 33 30.00 | 2.1607 | 26 17 37.0 | 6.081 |
| 6 | 19 35 39.55 | 2.1575 | 26 11 28.5 | 6.204 |
| 7 | 19 37 48.90 | 2.1542 | 26 5 12.6 | 6.326 |
| 8 | 19 39 58.05 | 2.1508 | 25 58 49.4 | 6.447 |
| 9 | 19 42 7.00 | 2.1476 | 25 52 19.0 | 6.567 |
| 10 | 19 44 15.76 | 2.1443 | 25 45 41.3 | 6.688 |
| 11 | 19 46 24.32 | 2.1409 | 25 38 56.4 | 6.808 |
| 12 | 19 48 32.67 | 2.1375 | 25 32 4.3 | 6.927 |
| 13 | 19 50 40.82 | 2.1341 | 25 25 5.1 | 7.046 |
| 14 | 19 52 48.76 | 2.1307 | 25 17 58.8 | 7.163 |
| 15 | 19 54 56.50 | 2.1272 | 25 10 45.5 | 7.280 |
| 16 | 19 57 4.03 | 2.1237 | 25 3 25.2 | 7.397 |
| 17 | 19 59 11.35 | 2.1202 | 24 55 57.9 | 7.512 |
| 18 | 20 1 18.46 | 2.1167 | 24 48 23.7 | 7.627 |
| 19 | 20 3 25.36 | 2.1132 | 24 40 42.7 | 7.741 |
| 20 | 20 5 32.04 | 2.1096 | 24 32 54.8 | 7.855 |
| 21 | 20 7 38.51 | 2.1060 | 24 25 0.1 | 7.968 |
| 22 | 20 9 44.76 | 2.1024 | 24 16 58.6 | 8.081 |
| 23 | 20 11 50.80 | 2.0988 | 24 8 50.4 | 8.192 |
| 24 | 20 13 56.62 | 2.0952 | S.24 0 35.6 | 8.302 |

### THURSDAY 31.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 20 13 56.62 | 2.0952 | S.24 0 35.6 | 8.302 |
| 1 | 20 16 2.22 | 2.0916 | 23 52 14.2 | 8.412 |
| 2 | 20 18 7.61 | 2.0880 | 23 43 46.2 | 8.522 |
| 3 | 20 20 12.78 | 2.0843 | 23 35 11.6 | 8.631 |
| 4 | 20 22 17.73 | 2.0807 | 23 26 30.5 | 8.738 |
| 5 | 20 24 22.46 | 2.0770 | 23 17 43.0 | 8.845 |
| 6 | 20 26 26.97 | 2.0733 | 23 8 49.1 | 8.952 |
| 7 | 20 28 31.26 | 2.0697 | 22 59 48.8 | 9.057 |
| 8 | 20 30 35.33 | 2.0661 | 22 50 42.2 | 9.162 |
| 9 | 20 32 39.19 | 2.0625 | 22 41 29.4 | 9.265 |
| 10 | 20 34 42.83 | 2.0588 | 22 32 10.4 | 9.368 |
| 11 | 20 36 46.24 | 2.0550 | 22 22 45.2 | 9.471 |
| 12 | 20 38 49.43 | 2.0513 | 22 13 13.9 | 9.572 |
| 13 | 20 40 52.40 | 2.0477 | 22 3 36.6 | 9.673 |
| 14 | 20 42 55.16 | 2.0441 | 21 53 53.2 | 9.773 |
| 15 | 20 44 57.70 | 2.0405 | 21 44 3.8 | 9.873 |
| 16 | 20 47 0.02 | 2.0369 | 21 34 8.4 | 9.972 |
| 17 | 20 49 2.13 | 2.0333 | 21 24 7.1 | 10.070 |
| 18 | 20 51 4.02 | 2.0297 | 21 14 0.0 | 10.167 |
| 19 | 20 53 5.69 | 2.0261 | 21 3 47.1 | 10.262 |
| 20 | 20 55 7.15 | 2.0226 | 20 53 28.5 | 10.357 |
| 21 | 20 57 8.40 | 2.0190 | 20 43 4.2 | 10.452 |
| 22 | 20 59 9.43 | 2.0154 | 20 32 34.3 | 10.546 |
| 23 | 21 1 10.25 | 2.0119 | S.20 21 58.7 | 10.639 |

### FRIDAY, SEPTEMBER 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 21 3 10.86 | 2.0084 | S.20 11 17.6 | 10.731 |

### PHASES OF THE MOON.

| | d | h | m |
|---|---|---|---|
| ○ Full Moon, . . . | 4 | 18 | 37.8 |
| ☾ Last Quarter, . . | 12 | 9 | 58.7 |
| ● New Moon, . . | 19 | 0 | 25.7 |
| ☽ First Quarter, . . | 26 | 6 | 17.8 |

| | d | h |
|---|---|---|
| ☾ Apogee, . . . . . . | 1 | 18.7 |
| ☾ Perigee, . . . . . . | 17 | 7.5 |
| ☾ Apogee, . . . . . . | 29 | 8.0 |

## GREENWICH MEAN TIME.

### LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Spica | W. | 65° 54′ 3″ | 3075 | 67° 22′ 43″ | 3076 | 68° 51′ 22″ | 3076 | 70° 20′ 1″ | 3076 |
| | Jupiter | W. | 36 9 6 | 3143 | 37 36 23 | 3140 | 39 3 44 | 3138 | 40 31 8 | 3134 |
| | Fomalhaut | E. | 63 57 46 | 3399 | 62 35 28 | 3408 | 61 13 20 | 3417 | 59 51 23 | 3428 |
| | Saturn | E. | 68 24 38 | 3052 | 66 55 30 | 3052 | 65 26 22 | 3053 | 63 57 15 | 3052 |
| | α Pegasi | E. | 85 45 20 | 3326 | 84 21 39 | 3328 | 82 58 0 | 3330 | 81 34 23 | 3332 |
| 2 | Spica | W. | 77 43 25 | 3071 | 79 12 10 | 3069 | 80 40 57 | 3067 | 82 9 47 | 3065 |
| | Jupiter | W. | 47 48 59 | 3120 | 49 16 44 | 3118 | 50 44 32 | 3114 | 52 12 24 | 3110 |
| | Antares | W. | 31 48 54 | 3071 | 33 17 39 | 3069 | 34 46 26 | 3067 | 36 15 16 | 3065 |
| | Fomalhaut | E. | 53 4 50 | 3490 | 51 44 15 | 3507 | 50 23 59 | 3525 | 49 4 2 | 3543 |
| | Saturn | E. | 56 31 28 | 3047 | 55 2 14 | 3046 | 53 32 58 | 3044 | 52 3 40 | 3042 |
| | α Pegasi | E. | 74 36 52 | 3342 | 73 13 29 | 3345 | 71 50 9 | 3347 | 70 26 52 | 3350 |
| 3 | Spica | W. | 89 34 42 | 3051 | 91 3 52 | 3047 | 92 33 7 | 3043 | 94 2 26 | 3039 |
| | Jupiter | W. | 59 32 50 | 3092 | 61 1 9 | 3088 | 62 29 33 | 3084 | 63 58 2 | 3080 |
| | Antares | W. | 43 40 11 | 3051 | 45 9 21 | 3047 | 46 38 36 | 3043 | 48 7 55 | 3039 |
| | Fomalhaut | E. | 42 30 7 | 3670 | 41 12 48 | 3705 | 39 56 6 | 3744 | 38 40 5 | 3787 |
| | Saturn | E. | 44 36 21 | 3027 | 43 6 42 | 3023 | 41 36 58 | 3020 | 40 7 10 | 3016 |
| | α Pegasi | E. | 63 31 23 | 3369 | 62 8 31 | 3375 | 60 45 46 | 3381 | 59 23 8 | 3387 |
| | α Arietis | E. | 104 36 43 | 3078 | 103 8 6 | 3074 | 101 39 25 | 3070 | 100 10 39 | 3066 |
| 4 | Spica | W. | 101 30 18 | 3018 | 103 0 9 | 3013 | 104 30 6 | 3008 | 106 0 9 | 3002 |
| | Jupiter | W. | 71 21 50 | 3056 | 72 50 53 | 3051 | 74 20 3 | 3046 | 75 49 19 | 3040 |
| | Antares | W. | 55 35 48 | 3018 | 57 5 39 | 3013 | 58 35 36 | 3008 | 60 5 39 | 3002 |
| | Saturn | E. | 32 36 53 | 2994 | 31 6 33 | 2989 | 29 36 7 | 2985 | 28 5 35 | 2980 |
| | α Pegasi | E. | 52 32 10 | 3434 | 51 10 32 | 3447 | 49 49 9 | 3463 | 48 28 3 | 3479 |
| | α Arietis | E. | 92 45 28 | 3043 | 91 16 9 | 3038 | 89 46 43 | 3034 | 88 17 12 | 3028 |
| 5 | Jupiter | W. | 83 17 20 | 3013 | 84 47 17 | 3006 | 86 17 22 | 3001 | 87 47 34 | 2995 |
| | Antares | W. | 67 37 35 | 2975 | 69 8 19 | 2969 | 70 39 11 | 2962 | 72 10 11 | 2957 |
| | α Arietis | E. | 80 47 57 | 3001 | 79 17 46 | 2995 | 77 47 27 | 2990 | 76 17 2 | 2984 |
| | Aldebaran | E. | 111 48 29 | 3060 | 110 19 30 | 3052 | 108 50 22 | 3044 | 107 21 4 | 3037 |
| 6 | Jupiter | W. | 95 20 29 | 2963 | 96 51 28 | 2957 | 98 22 35 | 2950 | 99 53 51 | 2943 |
| | Antares | W. | 79 47 6 | 2924 | 81 18 54 | 2918 | 82 50 50 | 2911 | 84 22 55 | 2904 |
| | α Aquilæ | W. | 41 7 10 | 5418 | 41 58 52 | 5260 | 42 52 29 | 5115 | 43 47 55 | 4984 |
| | α Arietis | E. | 68 43 5 | 2954 | 67 11 55 | 2949 | 65 40 38 | 2942 | 64 9 12 | 2936 |
| | Aldebaran | E. | 99 52 18 | 3001 | 98 22 6 | 2993 | 96 51 44 | 2985 | 95 21 13 | 2978 |
| 7 | Jupiter | W. | 107 32 18 | 2909 | 109 4 26 | 2901 | 110 36 43 | 2894 | 112 9 9 | 2887 |
| | Antares | W. | 92 5 37 | 2867 | 93 38 38 | 2859 | 95 11 49 | 2852 | 96 45 10 | 2844 |
| | α Aquilæ | W. | 48 48 47 | 4469 | 49 53 6 | 4389 | 50 58 37 | 4315 | 52 5 16 | 4245 |
| | α Arietis | E. | 56 30 7 | 2905 | 54 57 54 | 2898 | 53 25 33 | 2892 | 51 53 4 | 2687 |
| | Aldebaran | E. | 87 46 20 | 2942 | 86 14 54 | 2934 | 84 43 18 | 2927 | 83 11 33 | 2920 |
| | Venus | E. | 123 27 0 | 3023 | 121 57 16 | 3012 | 120 27 18 | 3001 | 118 57 8 | 2992 |
| 8 | Antares | W. | 104 34 30 | 2803 | 106 8 54 | 2794 | 107 43 30 | 2785 | 109 18 17 | 2776 |
| | α Aquilæ | W. | 57 53 35 | 3960 | 59 5 54 | 3915 | 60 18 59 | 3871 | 61 32 48 | 3829 |
| | α Arietis | E. | 44 8 46 | 2857 | 42 35 32 | 2852 | 41 2 11 | 2847 | 39 28 44 | 2842 |
| | Aldebaran | E. | 75 30 27 | 2882 | 73 57 45 | 2875 | 72 24 54 | 2868 | 70 51 54 | 2860 |
| | Venus | E. | 111 23 14 | 2945 | 109 51 52 | 2935 | 108 20 18 | 2926 | 106 48 32 | 2917 |
| | Pollux | E. | 118 37 6 | 2807 | 117 2 47 | 2798 | 115 28 16 | 2788 | 113 53 33 | 2780 |
| 9 | α Aquilæ | W. | 67 51 50 | 3656 | 69 9 24 | 3626 | 70 27 30 | 3598 | 71 46 6 | 3572 |
| | Fomalhaut | W. | 39 26 33 | 3402 | 40 48 47 | 3350 | 42 12 1 | 3302 | 43 36 10 | 3258 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | $\mathrm{XV}^{\mathrm{h}}$. | P. L. of Diff. | $\mathrm{XVIII}^{\mathrm{h}}$. | P. L. of Diff. | $\mathrm{XXI}^{\mathrm{h}}$. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Spica | W. | 71° 48′ 40″ | 3075 | 73° 17′ 20″ | 3075 | 74° 46′ 0″ | 3073 | 76° 14′ 42″ | 3073 |
| | Jupiter | W. | 41 58 36 | 3132 | 43 26 7 | 3129 | 44 53 41 | 3127 | 46 21 18 | 3124 |
| | Fomalhaut | E. | 58 29 38 | 3438 | 57 8 5 | 3451 | 55 46 46 | 3463 | 54 25 41 | 3476 |
| | Saturn | E. | 62 28 7 | 3052 | 60 58 59 | 3052 | 59 29 50 | 3051 | 58 0 40 | 3049 |
| | α Pegasi | E. | 80 10 48 | 3334 | 78 47 16 | 3336 | 77 23 46 | 3338 | 76 0 18 | 3339 |
| 2 | Spica | W. | 83 38 39 | 3063 | 85 7 34 | 3060 | 86 36 33 | 3056 | 88 5 36 | 3054 |
| | Jupiter | W. | 53 40 21 | 3107 | 55 8 22 | 3104 | 56 36 27 | 3101 | 58 4 36 | 3096 |
| | Antares | W. | 37 44 8 | 3063 | 39 13 3 | 3060 | 40 42 2 | 3056 | 42 11 5 | 3054 |
| | Fomalhaut | E. | 47 44 25 | 3564 | 46 25 11 | 3586 | 45 6 21 | 3611 | 43 47 59 | 3639 |
| | Saturn | E. | 50 34 19 | 3039 | 49 4 55 | 3036 | 47 35 27 | 3034 | 46 5 56 | 3030 |
| | α Pegasi | E. | 69 3 38 | 3353 | 67 40 28 | 3357 | 66 17 22 | 3360 | 64 54 20 | 3365 |
| 3 | Spica | W. | 95 31 50 | 3035 | 97 1 19 | 3031 | 98 30 53 | 3026 | 100 0 33 | 3022 |
| | Jupiter | W. | 65 26 36 | 3075 | 66 55 16 | 3071 | 68 24 1 | 3066 | 69 52 52 | 3060 |
| | Antares | W. | 49 37 19 | 3035 | 51 6 48 | 3030 | 52 36 23 | 3026 | 54 6 3 | 3022 |
| | Fomalhaut | E. | 37 24 49 | 3836 | 36 10 24 | 3892 | 34 56 56 | 3954 | 33 44 31 | 4025 |
| | Saturn | E. | 38 37 17 | 3012 | 37 7 19 | 3008 | 35 37 16 | 3003 | 34 7 7 | 2999 |
| | α Pegasi | E. | 58 0 37 | 3395 | 56 38 15 | 3403 | 55 16 2 | 3413 | 53 54 0 | 3423 |
| | α Arietis | E. | 98 41 48 | 3061 | 97 12 51 | 3057 | 95 43 49 | 3052 | 94 14 41 | 3048 |
| 4 | Spica | W. | 107 30 19 | 2997 | 109 0 35 | 2992 | 110 30 58 | 2986 | 112 1 28 | 2981 |
| | Jupiter | W. | 77 18 42 | 3035 | 78 48 11 | 3030 | 80 17 47 | 3024 | 81 47 30 | 3018 |
| | Antares | W. | 61 35 49 | 2997 | 63 6 5 | 2992 | 64 36 28 | 2986 | 66 6 58 | 2981 |
| | Saturn | E. | 26 34 57 | 2974 | 25 4 12 | 2969 | 23 33 21 | 2964 | 22 2 23 | 2958 |
| | α Pegasi | E. | 47 7 15 | 3497 | 45 46 48 | 3518 | 44 26 44 | 3542 | 43 7 6 | 3568 |
| | α Arietis | E. | 86 47 34 | 3023 | 85 17 50 | 3018 | 83 47 59 | 3012 | 82 18 1 | 3007 |
| 5 | Jupiter | W. | 89 17 53 | 2989 | 90 48 20 | 2982 | 92 18 55 | 2976 | 93 49 38 | 2969 |
| | Antares | W. | 73 41 18 | 2950 | 75 12 33 | 2944 | 76 43 56 | 2938 | 78 15 27 | 2931 |
| | α Arietis | E. | 74 46 29 | 2978 | 73 15 49 | 2973 | 71 45 2 | 2966 | 70 14 7 | 2961 |
| | Aldebaran | E. | 105 51 37 | 3030 | 104 22 1 | 3022 | 102 52 16 | 3015 | 101 22 22 | 3007 |
| 6 | Jupiter | W. | 101 25 15 | 2936 | 102 56 48 | 2930 | 104 28 29 | 2923 | 106 0 19 | 2916 |
| | Antares | W. | 85 55 9 | 2897 | 87 27 32 | 2890 | 89 0 4 | 2882 | 90 32 46 | 2875 |
| | α Aquilæ | W. | 44 45 3 | 4864 | 45 43 47 | 4753 | 46 44 2 | 4650 | 47 45 44 | 4556 |
| | α Arietis | E. | 62 37 39 | 2930 | 61 5 58 | 2924 | 59 34 9 | 2917 | 58 2 12 | 2911 |
| | Aldebaran | E. | 93 50 33 | 2971 | 92 19 44 | 2963 | 90 48 45 | 2956 | 89 17 37 | 2949 |
| 7 | Jupiter | W. | 113 41 44 | 2880 | 115 14 29 | 2873 | 116 47 23 | 2865 | 118 20 27 | 2857 |
| | Antares | W. | 98 18 41 | 2836 | 99 52 22 | 2828 | 101 26 14 | 2819 | 103 0 17 | 2811 |
| | α Aquilæ | W. | 53 13 0 | 4180 | 54 21 45 | 4119 | 55 31 28 | 4063 | 56 42 6 | 4011 |
| | α Arietis | E. | 50 20 28 | 2880 | 48 47 44 | 2874 | 47 14 52 | 2869 | 45 41 53 | 2862 |
| | Aldebaran | E. | 81 39 39 | 2912 | 80 7 35 | 2905 | 78 35 22 | 2897 | 77 2 59 | 2890 |
| | Venus | E. | 117 26 45 | 2982 | 115 56 10 | 2973 | 114 25 23 | 2963 | 112 54 24 | 2954 |
| 8 | Antares | W. | 110 53 16 | 2768 | 112 28 26 | 2758 | 114 3 49 | 2749 | 115 39 24 | 2739 |
| | α Aquilæ | W. | 62 47 20 | 3791 | 64 2 32 | 3754 | 65 18 22 | 3719 | 66 34 49 | 3687 |
| | α Arietis | E. | 37 55 11 | 2838 | 36 21 33 | 2835 | 34 47 50 | 2831 | 33 14 3 | 2829 |
| | Aldebaran | E. | 69 18 44 | 2853 | 67 45 25 | 2846 | 66 11 57 | 2839 | 64 38 20 | 2831 |
| | Venus | E. | 105 16 35 | 2908 | 103 44 26 | 2899 | 102 12 6 | 2890 | 100 39 34 | 2880 |
| | Pollux | E. | 112 18 39 | 2771 | 110 43 33 | 2762 | 109 8 15 | 2752 | 107 32 44 | 2743 |
| 9 | α Aquilæ | W. | 73 5 11 | 3547 | 74 24 43 | 3524 | 75 44 41 | 3501 | 77 5 4 | 3479 |
| | Fomalhaut | W. | 45 1 11 | 3217 | 46 27 0 | 3179 | 47 53 34 | 3143 | 49 20 51 | 3110 |

## GREENWICH MEAN TIME.

### LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | | | P. L. of Diff. | IIIh. | | | P. L. of Diff. | VIh. | | | P. L. of Diff. | IXh. | | | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ° | ′ | ″ | | ° | ′ | ″ | | ° | ′ | ″ | | ° | ′ | ″ | |
| 9 | Saturn | W. | 29 | 23 | 31 | 2707 | 31 | 0 | 1 | 2697 | 32 | 36 | 45 | 2687 | 34 | 13 | 42 | 2677 |
| | Aldebaran | E. | 63 | 4 | 33 | 2825 | 61 | 30 | 37 | 2818 | 59 | 56 | 33 | 2811 | 58 | 22 | 20 | 2805 |
| | Venus | E. | 99 | 6 | 50 | 2871 | 97 | 33 | 54 | 2862 | 96 | 0 | 47 | 2853 | 94 | 27 | 28 | 2843 |
| | Pollux | E. | 105 | 57 | 1 | 2733 | 104 | 21 | 5 | 2723 | 102 | 44 | 56 | 2713 | 101 | 8 | 34 | 2703 |
| | Sun | E. | 131 | 52 | 34 | 3078 | 130 | 23 | 57 | 3067 | 128 | 55 | 7 | 3056 | 127 | 26 | 3 | 3044 |
| 10 | α Aquilæ | W. | 78 | 25 | 52 | 3459 | 79 | 47 | 2 | 3430 | 81 | 8 | 34 | 3422 | 82 | 30 | 26 | 3404 |
| | Fomalhaut | W. | 50 | 48 | 48 | 3079 | 52 | 17 | 23 | 3049 | 53 | 46 | 35 | 3022 | 55 | 16 | 21 | 2995 |
| | Saturn | W. | 42 | 21 | 55 | 2624 | 44 | 0 | 17 | 2614 | 45 | 38 | 53 | 2602 | 42 | 17 | 45 | 2591 |
| | α Pegasi | W. | 30 | 51 | 22 | 3743 | 32 | 7 | 24 | 3635 | 33 | 25 | 21 | 3540 | 34 | 45 | 1 | 3456 |
| | Aldebaran | E. | 50 | 29 | 14 | 2777 | 48 | 54 | 16 | 2772 | 47 | 19 | 12 | 2769 | 45 | 44 | 3 | 2766 |
| | Venus | E. | 86 | 37 | 49 | 2797 | 85 | 3 | 17 | 2787 | 83 | 28 | 32 | 2778 | 81 | 53 | 35 | 2768 |
| | Pollux | E. | 93 | 3 | 17 | 2651 | 91 | 25 | 31 | 2640 | 89 | 47 | 30 | 2629 | 88 | 9 | 14 | 2617 |
| | Sun | E. | 119 | 57 | 10 | 2986 | 118 | 26 | 40 | 2973 | 116 | 55 | 54 | 2962 | 115 | 24 | 53 | 2950 |
| 11 | α Aquilæ | W. | 89 | 24 | 19 | 3333 | 90 | 47 | 52 | 3321 | 92 | 11 | 39 | 3311 | 93 | 35 | 38 | 3302 |
| | Fomalhaut | W. | 62 | 53 | 5 | 2877 | 64 | 25 | 53 | 2857 | 65 | 59 | 7 | 2837 | 67 | 32 | 47 | 2817 |
| | Saturn | W. | 55 | 35 | 57 | 2533 | 57 | 16 | 24 | 2522 | 58 | 57 | 7 | 2510 | 60 | 38 | 7 | 2497 |
| | α Pegasi | W. | 41 | 44 | 12 | 3143 | 43 | 11 | 29 | 3096 | 44 | 39 | 44 | 3052 | 46 | 8 | 52 | 3011 |
| | Venus | E. | 73 | 55 | 39 | 2719 | 72 | 19 | 25 | 2710 | 70 | 42 | 59 | 2701 | 69 | 6 | 20 | 2692 |
| | Pollux | E. | 79 | 53 | 59 | 2559 | 78 | 14 | 8 | 2548 | 76 | 34 | 1 | 2535 | 74 | 53 | 37 | 2523 |
| | Sun | E. | 107 | 45 | 53 | 2886 | 106 | 13 | 16 | 2873 | 104 | 40 | 22 | 2860 | 103 | 7 | 12 | 2846 |
| 12 | Fomalhaut | W. | 75 | 27 | 17 | 2728 | 77 | 3 | 20 | 2711 | 78 | 39 | 45 | 2695 | 80 | 16 | 32 | 2680 |
| | Saturn | W. | 69 | 7 | 29 | 2435 | 70 | 50 | 14 | 2422 | 72 | 33 | 18 | 2409 | 74 | 16 | 40 | 2396 |
| | α Pegasi | W. | 53 | 46 | 16 | 2843 | 55 | 19 | 48 | 2815 | 56 | 53 | 57 | 2788 | 58 | 28 | 41 | 2762 |
| | Venus | E. | 61 | 0 | 0 | 2646 | 59 | 22 | 8 | 2638 | 57 | 44 | 5 | 2630 | 56 | 5 | 51 | 2622 |
| | Pollux | E. | 66 | 27 | 20 | 2461 | 64 | 45 | 12 | 2448 | 63 | 2 | 46 | 2436 | 61 | 20 | 2 | 2423 |
| | Sun | E. | 95 | 16 | 57 | 2779 | 93 | 42 | 1 | 2764 | 92 | 6 | 46 | 2751 | 90 | 31 | 14 | 2737 |
| 13 | Fomalhaut | W. | 88 | 25 | 25 | 2609 | 90 | 4 | 8 | 2596 | 91 | 43 | 8 | 2584 | 93 | 22 | 25 | 2572 |
| | Saturn | W. | 82 | 58 | 4 | 2333 | 84 | 43 | 16 | 2320 | 86 | 28 | 47 | 2307 | 88 | 14 | 37 | 2294 |
| | α Pegasi | W. | 66 | 30 | 21 | 2649 | 68 | 8 | 10 | 2629 | 69 | 46 | 26 | 2610 | 71 | 25 | 8 | 2591 |
| | Venus | E. | 47 | 52 | 15 | 2592 | 46 | 13 | 9 | 2588 | 44 | 33 | 57 | 2585 | 42 | 54 | 41 | 2584 |
| | Pollux | E. | 52 | 41 | 51 | 2359 | 50 | 57 | 18 | 2347 | 49 | 12 | 27 | 2335 | 47 | 27 | 18 | 2322 |
| | Sun | E. | 82 | 28 | 56 | 2668 | 80 | 51 | 33 | 2654 | 79 | 13 | 51 | 2640 | 77 | 35 | 51 | 2626 |
| 14 | Saturn | W. | 97 | 8 | 20 | 2233 | 98 | 55 | 59 | 2221 | 100 | 43 | 55 | 2209 | 102 | 32 | 9 | 2198 |
| | α Pegasi | W. | 79 | 44 | 36 | 2510 | 81 | 25 | 36 | 2496 | 83 | 6 | 55 | 2482 | 84 | 48 | 33 | 2469 |
| | α Arietis | W. | 36 | 43 | 59 | 2324 | 38 | 29 | 24 | 2307 | 40 | 15 | 14 | 2291 | 42 | 1 | 27 | 2275 |
| | Venus | E. | 34 | 38 | 41 | 2605 | 32 | 59 | 53 | 2618 | 31 | 21 | 23 | 2636 | 29 | 43 | 17 | 2660 |
| | Pollux | E. | 38 | 37 | 7 | 2263 | 36 | 50 | 13 | 2252 | 35 | 3 | 3 | 2241 | 33 | 15 | 37 | 2231 |
| | Sun | E. | 69 | 21 | 15 | 2561 | 67 | 41 | 26 | 2548 | 66 | 1 | 20 | 2535 | 64 | 20 | 56 | 2523 |
| 15 | α Arietis | W. | 50 | 57 | 57 | 2208 | 52 | 46 | 13 | 2196 | 54 | 34 | 47 | 2184 | 56 | 23 | 38 | 2174 |
| | Sun | E. | 55 | 54 | 49 | 2467 | 54 | 12 | 49 | 2457 | 52 | 30 | 35 | 2447 | 50 | 48 | 7 | 2438 |
| 16 | α Arietis | W. | 65 | 31 | 31 | 2131 | 67 | 21 | 43 | 2123 | 69 | 12 | 7 | 2116 | 71 | 2 | 41 | 2111 |
| | Sun | E. | 42 | 12 | 41 | 2398 | 40 | 29 | 3 | 2392 | 38 | 45 | 17 | 2387 | 37 | 1 | 23 | 2381 |
| 21 | Sun | W. | 26 | 38 | 23 | 2638 | 28 | 16 | 26 | 2655 | 29 | 54 | 7 | 2671 | 31 | 31 | 26 | 2688 |
| | Jupiter | E. | 58 | 25 | 5 | 2375 | 56 | 40 | 55 | 2393 | 54 | 57 | 10 | 2410 | 53 | 13 | 50 | 2429 |
| 22 | Sun | W. | 39 | 32 | 12 | 2778 | 41 | 7 | 9 | 2796 | 42 | 41 | 42 | 2815 | 44 | 15 | 51 | 2834 |
| | Jupiter | E. | 44 | 43 | 53 | 2526 | 43 | 3 | 16 | 2547 | 41 | 23 | 8 | 2568 | 39 | 43 | 29 | 2589 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Saturn | W. | 35° 50′ 53″ | 2666 | 37° 28′ 18″ | 2657 | 39° 5′ 56″ | 2646 | 40° 43′ 48″ | 2635 |
| | Aldebaran | E. | 56 47 58 | 2798 | 55 13 28 | 2793 | 53 38 51 | 2787 | 52 4 6 | 2782 |
| | Venus | E. | 92 53 56 | 2835 | 91 20 13 | 2825 | 89 46 17 | 2815 | 88 12 9 | 2806 |
| | Pollux | E. | 99 31 58 | 2693 | 97 55 9 | 2683 | 96 18 6 | 2672 | 94 40 49 | 2661 |
| | Sun | E. | 125 56 45 | 3033 | 124 27 13 | 3021 | 122 57 26 | 3009 | 121 27 25 | 2998 |
| 10 | α Aquilæ | W. | 83 52 38 | 3388 | 85 15 8 | 3372 | 86 37 56 | 3358 | 88 1 0 | 3345 |
| | Fomalhaut | W. | 56 46 40 | 2969 | 58 17 31 | 2945 | 59 48 53 | 2921 | 61 20 45 | 2899 |
| | Saturn | W. | 48 56 52 | 2580 | 50 36 15 | 2569 | 52 15 53 | 2557 | 53 55 47 | 2545 |
| | α Pegasi | W. | 36 6 14 | 3380 | 37 28 53 | 3313 | 38 52 49 | 3252 | 40 17 57 | 3195 |
| | Aldebaran | E. | 44 8 51 | 2764 | 42 33 36 | 2763 | 40 58 19 | 2763 | 39 23 3 | 2765 |
| | Venus | E. | 80 18 25 | 2758 | 78 43 2 | 2749 | 77 7 27 | 2739 | 75 31 39 | 2730 |
| | Pollux | E. | 86 30 42 | 2606 | 84 51 55 | 2594 | 83 12 52 | 2583 | 81 33 34 | 2571 |
| | Sun | E. | 113 53 37 | 2937 | 112 22 5 | 2924 | 110 50 17 | 2912 | 109 18 13 | 2899 |
| 11 | α Aquilæ | W. | 94 59 47 | 3294 | 96 24 6 | 3287 | 97 48 33 | 3281 | 99 13 7 | 3276 |
| | Fomalhaut | W. | 69 6 53 | 2798 | 70 41 23 | 2779 | 72 16 18 | 2762 | 73 51 36 | 2744 |
| | Saturn | W. | 62 19 25 | 2485 | 64 1 0 | 2472 | 65 42 52 | 2460 | 67 25 2 | 2448 |
| | α Pegasi | W. | 47 38 51 | 2973 | 49 9 38 | 2938 | 50 41 9 | 2905 | 52 13 22 | 2873 |
| | Venus | E. | 67 29 29 | 2682 | 65 52 25 | 2673 | 64 15 9 | 2663 | 62 37 40 | 2655 |
| | Pollux | E. | 73 12 56 | 2511 | 71 31 58 | 2499 | 69 50 43 | 2486 | 68 9 10 | 2474 |
| | Sun | E. | 101 33 44 | 2833 | 99 59 59 | 2819 | 98 25 56 | 2805 | 96 51 35 | 2792 |
| 12 | Fomalhaut | W. | 81 53 39 | 2664 | 83 31 7 | 2650 | 85 8 54 | 2636 | 86 47 0 | 2622 |
| | Saturn | W. | 76 0 20 | 2384 | 77 44 18 | 2371 | 79 28 35 | 2358 | 81 13 10 | 2345 |
| | α Pegasi | W. | 60 3 59 | 2738 | 61 39 49 | 2714 | 63 16 10 | 2692 | 64 53 1 | 2670 |
| | Venus | E. | 54 27 26 | 2615 | 52 48 52 | 2608 | 51 10 8 | 2601 | 49 31 15 | 2596 |
| | Pollux | E. | 59 37 0 | 2410 | 57 53 40 | 2398 | 56 10 2 | 2385 | 54 26 6 | 2372 |
| | Sun | E. | 88 55 23 | 2723 | 87 19 14 | 2710 | 85 42 47 | 2695 | 84 6 1 | 2681 |
| 13 | Fomalhaut | W. | 95 1 59 | 2561 | 96 41 48 | 2551 | 98 21 51 | 2540 | 100 2 8 | 2531 |
| | Saturn | W. | 90 0 45 | 2282 | 91 47 11 | 2269 | 93 33 56 | 2257 | 95 20 59 | 2245 |
| | α Pegasi | W. | 73 4 15 | 2574 | 74 43 46 | 2557 | 76 23 40 | 2540 | 78 3 57 | 2525 |
| | Venus | E. | 41 15 24 | 2583 | 39 36 6 | 2585 | 37 56 51 | 2590 | 36 17 42 | 2596 |
| | Pollux | E. | 45 41 51 | 2310 | 43 56 6 | 2298 | 42 10 4 | 2286 | 40 23 44 | 2274 |
| | Sun | E. | 75 57 32 | 2613 | 74 18 55 | 2600 | 72 40 0 | 2586 | 71 0 46 | 2574 |
| 14 | Saturn | W. | 104 20 40 | 2186 | 106 9 28 | 2176 | 107 58 32 | 2165 | 109 47 52 | 2155 |
| | α Pegasi | W. | 86 30 30 | 2457 | 88 12 44 | 2445 | 89 55 14 | 2435 | 91 37 59 | 2425 |
| | α Arietis | W. | 43 48 3 | 2260 | 45 35 1 | 2246 | 47 22 20 | 2233 | 49 9 59 | 2220 |
| | Venus | E. | 28 5 43 | 2690 | 26 28 50 | 2729 | 24 52 48 | 2779 | 23 17 52 | 2843 |
| | Pollux | E. | 31 27 55 | 2221 | 29 39 59 | 2211 | 27 51 48 | 2202 | 26 3 24 | 2195 |
| | Sun | E. | 62 40 15 | 2512 | 60 59 18 | 2499 | 59 18 4 | 2488 | 57 36 34 | 2477 |
| 15 | α Arietis | W. | 58 12 44 | 2165 | 60 2 5 | 2155 | 61 51 41 | 2146 | 63 41 30 | 2138 |
| | Sun | E. | 49 5 26 | 2429 | 47 22 32 | 2420 | 45 39 26 | 2412 | 43 56 9 | 2405 |
| 16 | α Arietis | W. | 72 53 23 | 2106 | 74 44 13 | 2101 | 76 35 10 | 2098 | 78 26 13 | 2094 |
| | Sun | E. | 35 17 21 | 2377 | 33 33 13 | 2374 | 31 49 1 | 2371 | 30 4 45 | 2369 |
| 21 | Sun | W. | 33 8 22 | 2705 | 34 44 55 | 2722 | 36 21 5 | 2741 | 37 56 51 | 2760 |
| | Jupiter | E. | 51 30 57 | 2448 | 49 48 30 | 2467 | 48 6 30 | 2487 | 46 24 58 | 2506 |
| 22 | Sun | W. | 45 49 35 | 2852 | 47 22 55 | 2872 | 48 55 50 | 2891 | 50 28 21 | 2909 |
| | Jupiter | E. | 38 4 19 | 2612 | 36 25 40 | 2634 | 34 47 31 | 2657 | 33 9 53 | 2681 |

## GREENWICH MEAN TIME.

### LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | Antares | E. | 58° 49′ 41″ | 2454 | 57° 7′ 23″ | 2472 | 55° 25′ 30″ | 2489 | 53° 44′ 2″ | 2507 |
| | α Aquilæ | E. | 108 58 43 | 3336 | 107 35 13 | 3337 | 106 11 44 | 3339 | 104 48 18 | 3344 |
| 23 | Sun | W. | 52 0 28 | 2928 | 53 32 11 | 2947 | 55 3 30 | 2965 | 56 34 26 | 2985 |
| | Antares | E. | 45 22 54 | 2596 | 43 43 54 | 2614 | 42 5 18 | 2632 | 40 27 6 | 2649 |
| | α Aquilæ | E. | 97 53 4 | 3388 | 96 30 34 | 3401 | 95 8 19 | 3415 | 93 46 19 | 3429 |
| 24 | Sun | W. | 64 3 19 | 3075 | 65 31 59 | 3092 | 67 0 18 | 3110 | 68 28 16 | 3126 |
| | Antares | E. | 32 21 54 | 2734 | 30 45 59 | 2750 | 29 10 25 | 2766 | 27 35 12 | 2782 |
| | α Aquilæ | E. | 87 0 42 | 3515 | 85 40 34 | 3534 | 84 20 47 | 3554 | 83 1 22 | 3576 |
| 25 | Sun | W. | 75 43 11 | 3205 | 77 9 14 | 3220 | 78 35 0 | 3234 | 80 0 29 | 3248 |
| | Spica | W. | 26 11 41 | 2855 | 27 44 57 | 2869 | 29 17 56 | 2882 | 30 50 38 | 2894 |
| | α Aquilæ | E. | 76 30 18 | 3692 | 75 13 22 | 3717 | 73 56 53 | 3744 | 72 40 52 | 3772 |
| 26 | Sun | W. | 87 3 58 | 3311 | 88 27 57 | 3322 | 89 51 43 | 3333 | 91 15 16 | 3343 |
| | Spica | W. | 38 30 15 | 2952 | 40 1 28 | 2962 | 41 32 28 | 2973 | 43 3 15 | 2981 |
| | α Aquilæ | E. | 66 28 21 | 3925 | 65 15 27 | 3960 | 64 3 8 | 3997 | 62 51 25 | 4034 |
| | Fomalhaut | E. | 89 38 42 | 3206 | 88 12 40 | 3216 | 86 46 50 | 3227 | 85 21 13 | 3238 |
| | α Pegasi | E. | 111 36 39 | 3237 | 110 11 14 | 3242 | 108 45 55 | 3247 | 107 20 42 | 3252 |
| 27 | Sun | W. | 98 10 19 | 3386 | 99 32 51 | 3393 | 100 55 15 | 3401 | 102 17 30 | 3408 |
| | Spica | W. | 50 34 28 | 3022 | 52 4 13 | 3029 | 53 33 50 | 3034 | 55 3 20 | 3041 |
| | Jupiter | W. | 19 15 43 | 3234 | 20 41 12 | 3222 | 22 6 55 | 3211 | 23 32 51 | 3202 |
| | α Aquilæ | E. | 57 2 40 | 4254 | 55 55 5 | 4306 | 54 48 18 | 4361 | 53 42 21 | 4419 |
| | Fomalhaut | E. | 78 16 13 | 3289 | 76 51 49 | 3299 | 75 27 36 | 3309 | 74 3 35 | 3319 |
| | α Pegasi | E. | 100 16 2 | 3277 | 98 51 24 | 3281 | 97 26 50 | 3285 | 96 2 21 | 3290 |
| 28 | Sun | W. | 109 7 11 | 3431 | 110 28 53 | 3435 | 111 50 30 | 3438 | 113 12 4 | 3439 |
| | Spica | W. | 62 29 12 | 3063 | 63 58 7 | 3065 | 65 26 59 | 3068 | 66 55 48 | 3070 |
| | Jupiter | W. | 30 44 39 | 3177 | 32 11 16 | 3174 | 33 37 56 | 3172 | 35 4 39 | 3170 |
| | Fomalhaut | E. | 67 6 20 | 3368 | 65 43 27 | 3379 | 64 20 46 | 3390 | 62 58 18 | 3400 |
| | α Pegasi | E. | 89 1 13 | 3310 | 87 37 13 | 3313 | 86 13 17 | 3317 | 84 49 25 | 3320 |
| 29 | Sun | W. | 119 59 28 | 3444 | 121 20 55 | 3444 | 122 42 22 | 3443 | 124 3 50 | 3442 |
| | Spica | W. | 74 19 22 | 3074 | 75 48 3 | 3074 | 77 16 44 | 3073 | 78 45 26 | 3072 |
| | Jupiter | W. | 42 18 49 | 3159 | 43 45 47 | 3157 | 45 12 48 | 3154 | 46 39 52 | 3151 |
| | Antares | W. | 28 24 55 | 3075 | 29 53 35 | 3074 | 31 22 16 | 3073 | 32 50 58 | 3073 |
| | Fomalhaut | E. | 56 9 7 | 3461 | 54 47 59 | 3474 | 53 27 6 | 3489 | 52 6 30 | 3506 |
| | α Pegasi | E. | 77 51 1 | 3335 | 76 27 30 | 3338 | 75 4 3 | 3341 | 73 40 39 | 3344 |
| 30 | Spica | W. | 86 9 29 | 3060 | 87 38 27 | 3057 | 89 7 29 | 3053 | 90 36 36 | 3049 |
| | Jupiter | W. | 53 56 13 | 3133 | 55 23 43 | 3129 | 56 51 18 | 3124 | 58 18 59 | 3119 |
| | Antares | W. | 40 14 59 | 3060 | 41 43 57 | 3057 | 43 12 59 | 3053 | 44 42 6 | 3049 |
| | Fomalhaut | E. | 45 28 23 | 3607 | 44 9 56 | 3634 | 42 51 58 | 3663 | 41 34 32 | 3696 |
| | α Pegasi | E. | 66 44 29 | 3359 | 65 21 26 | 3364 | 63 58 28 | 3368 | 62 35 35 | 3372 |
| | α Arietis | E. | 108 1 27 | 3087 | 106 33 2 | 3084 | 105 4 33 | 3080 | 103 35 59 | 3075 |
| 31 | Spica | W. | 98 3 33 | 3025 | 99 33 15 | 3018 | 101 3 5 | 3013 | 102 33 2 | 3006 |
| | Jupiter | W. | 65 38 55 | 3091 | 67 7 15 | 3085 | 68 35 43 | 3079 | 70 4 18 | 3072 |
| | Antares | W. | 52 9 3 | 3025 | 53 38 45 | 3018 | 55 8 35 | 3013 | 56 38 32 | 3006 |
| | α Pegasi | E. | 55 42 39 | 3404 | 54 20 27 | 3412 | 52 58 24 | 3423 | 51 36 33 | 3434 |
| | α Arietis | E. | 96 11 40 | 3050 | 94 42 29 | 3043 | 93 13 10 | 3037 | 91 43 43 | 3031 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | Antares | E. | 52° 2′ 59″ | 2525 | 50° 22′ 21″ | 2543 | 48° 42′ 7″ | 2561 | 47° 2′ 18″ | 2579 |
| | α Aquilæ | E. | 103 24 58 | 3351 | 102 1 45 | 3358 | 100 38 41 | 3367 | 99 15 47 | 3377 |
| 23 | Sun | W. | 58 4 58 | 3003 | 59 35 7 | 3022 | 61 4 53 | 3039 | 62 34 17 | 3057 |
| | Antares | E. | 38 49 18 | 2666 | 37 11 53 | 2684 | 35 34 51 | 2700 | 33 58 11 | 2717 |
| | α Aquilæ | E. | 92 24 35 | 3444 | 91 3 8 | 3461 | 89 42 0 | 3478 | 88 21 11 | 3496 |
| 24 | Sun | W. | 69 55 54 | 3143 | 71 23 12 | 3159 | 72 50 10 | 3174 | 74 16 50 | 3190 |
| | Antares | E. | 26 0 20 | 2797 | 24 25 48 | 2811 | 22 51 35 | 2827 | 21 17 42 | 2842 |
| | α Aquilæ | E. | 81 42 21 | 3597 | 80 23 43 | 3619 | 79 5 29 | 3642 | 77 47 40 | 3667 |
| 25 | Sun | W. | 81 25 41 | 3261 | 82 50 38 | 3275 | 84 15 19 | 3287 | 85 39 46 | 3300 |
| | Spica | W. | 32 23 4 | 2907 | 33 55 14 | 2919 | 35 27 9 | 2931 | 36 58 49 | 2942 |
| | α Aquilæ | E. | 71 25 21 | 3800 | 70 10 19 | 3830 | 68 55 48 | 3860 | 67 41 48 | 3892 |
| 26 | Sun | W. | 92 38 38 | 3352 | 94 1 49 | 3362 | 95 24 49 | 3371 | 96 47 39 | 3379 |
| | Spica | W. | 44 33 51 | 2990 | 46 4 16 | 2999 | 47 34 30 | 3007 | 49 4 34 | 3015 |
| | α Aquilæ | E. | 61 40 19 | 4074 | 60 29 52 | 4115 | 59 20 5 | 4160 | 58 11 1 | 4205 |
| | Fomalhaut | E. | 83 55 49 | 3248 | 82 30 37 | 3259 | 81 5 37 | 3269 | 79 40 49 | 3279 |
| | α Pegasi | E. | 105 55 34 | 3257 | 104 30 32 | 3262 | 103 5 36 | 3267 | 101 40 46 | 3272 |
| 27 | Sun | W. | 103 39 38 | 3413 | 105 1 40 | 3419 | 106 23 35 | 3423 | 107 45 25 | 3427 |
| | Spica | W. | 56 32 42 | 3046 | 58 1 58 | 3051 | 59 31 8 | 3055 | 61 0 13 | 3060 |
| | Jupiter | W. | 24 58 58 | 3194 | 26 25 14 | 3188 | 27 51 37 | 3183 | 29 18 6 | 3180 |
| | α Aquilæ | E. | 52 37 17 | 4481 | 51 33 8 | 4548 | 50 29 58 | 4618 | 49 27 49 | 4696 |
| | Fomalhaut | E. | 72 39 45 | 3329 | 71 16 7 | 3338 | 69 52 40 | 3348 | 68 29 24 | 3358 |
| | α Pegasi | E. | 94 37 58 | 3294 | 93 13 40 | 3298 | 91 49 26 | 3302 | 90 25 17 | 3306 |
| 28 | Sun | W. | 114 33 36 | 3441 | 115 55 6 | 3443 | 117 16 34 | 3444 | 118 38 1 | 3444 |
| | Spica | W. | 68 24 34 | 3072 | 69 53 18 | 3073 | 71 22 0 | 3074 | 72 50 41 | 3074 |
| | Jupiter | W. | 36 31 24 | 3168 | 37 58 12 | 3166 | 39 25 2 | 3164 | 40 51 54 | 3162 |
| | Fomalhaut | E. | 61 36 2 | 3411 | 60 13 58 | 3423 | 58 52 7 | 3435 | 57 30 30 | 3447 |
| | α Pegasi | E. | 83 25 37 | 3324 | 82 1 53 | 3326 | 80 38 12 | 3330 | 79 14 35 | 3332 |
| 29 | Sun | W. | 125 25 19 | 3440 | 126 46 50 | 3438 | 128 8 24 | 3435 | 129 30 1 | 3432 |
| | Spica | W. | 80 14 10 | 3070 | 81 42 56 | 3069 | 83 11 44 | 3066 | 84 40 35 | 3064 |
| | Jupiter | W. | 48 7 0 | 3148 | 49 34 12 | 3144 | 51 1 28 | 3141 | 52 28 48 | 3137 |
| | Antares | W. | 34 19 41 | 3071 | 35 48 26 | 3069 | 37 17 14 | 3066 | 38 46 5 | 3064 |
| | Fomalhaut | E. | 50 46 12 | 3522 | 49 26 12 | 3541 | 48 6 33 | 3561 | 46 47 16 | 3583 |
| | α Pegasi | E. | 72 17 18 | 3346 | 70 54 0 | 3350 | 69 30 46 | 3353 | 68 7 36 | 3356 |
| 30 | Spica | W. | 92 5 48 | 3045 | 93 35 5 | 3040 | 95 4 28 | 3035 | 96 33 57 | 3030 |
| | Jupiter | W. | 59 46 45 | 3114 | 61 14 38 | 3109 | 62 42 37 | 3104 | 64 10 42 | 3097 |
| | Antares | W. | 46 11 18 | 3045 | 47 40 35 | 3040 | 49 9 58 | 3035 | 50 39 27 | 3030 |
| | Fomalhaut | E. | 40 17 41 | 3733 | 39 1 29 | 3774 | 37 46 0 | 3820 | 36 31 19 | 3873 |
| | α Pegasi | E. | 61 12 47 | 3378 | 59 50 5 | 3383 | 58 27 29 | 3389 | 57 5 0 | 3396 |
| | α Arietis | E. | 102 7 19 | 3071 | 100 38 34 | 3065 | 99 9 42 | 3060 | 97 40 44 | 3056 |
| 31 | Spica | W. | 104 3 7 | 3000 | 105 33 20 | 2993 | 107 3 41 | 2986 | 108 34 11 | 2979 |
| | Jupiter | W. | 71 33 2 | 3065 | 73 1 54 | 3058 | 74 30 55 | 3052 | 76 0 4 | 3043 |
| | Antares | W. | 58 8 37 | 3000 | 59 38 50 | 2993 | 61 9 11 | 2986 | 62 39 41 | 2979 |
| | α Pegasi | E. | 50 14 55 | 3446 | 48 53 30 | 3460 | 47 32 21 | 3476 | 46 11 30 | 3495 |
| | α Arietis | E. | 90 14 9 | 3025 | 88 44 27 | 3018 | 87 14 36 | 3011 | 85 44 37 | 3005 |

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be subtracted from Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | Semi-diameter. | | | |
| | | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Frid. | 1 | 10 43 40.31 | 9.062 | N. 8 4 27.2 | −54.64 | 15 53.86 | 64.39 | 0 17.45 | 0.792 |
| Sat. | 2 | 10 47 17.64 | 9.050 | 7 42 32.1 | 54.96 | 15 54.09 | 64.35 | 0 36.62 | 0.804 |
| *Sun.* | 3 | 10 50 54.71 | 9.039 | 7 20 29.6 | 55.26 | 15 54.33 | 64.31 | 0 56.06 | 0.815 |
| Mon. | 4 | 10 54 31.53 | 9.029 | 6 58 19.9 | 55.55 | 15 54.57 | 64.27 | 1 15.75 | 0.825 |
| Tues. | 5 | 10 58 8.11 | 9.020 | 6 36 3.4 | 55.83 | 15 54.81 | 64.24 | 1 35.67 | 0.834 |
| Wed. | 6 | 11 1 44.47 | 9.012 | 6 13 40.3 | 56.10 | 15 54.05 | 64.21 | 1 55.80 | 0.842 |
| Thur. | 7 | 11 5 20.64 | 9.005 | 5 51 10.8 | 56.36 | 15 55.29 | 64.18 | 2 16.12 | 0.850 |
| Frid. | 8 | 11 8 56.66 | 8.998 | 5 28 35.4 | 56.60 | 15 55.53 | 64.15 | 2 36.61 | 0.856 |
| Sat. | 9 | 11 12 32.53 | 8.992 | 5 5 54.4 | 56.83 | 15 55.78 | 64.13 | 2 57.25 | 0.862 |
| *Sun.* | 10 | 11 16 8.27 | 8.987 | 4 43 8.1 | 57.05 | 15 56.02 | 64.11 | 3 18.01 | 0.867 |
| Mon. | 11 | 11 19 43.90 | 8.983 | 4 20 16.6 | 57.24 | 15 56.27 | 64.10 | 3 38.87 | 0.871 |
| Tues. | 12 | 11 23 19.45 | 8.980 | 3 57 20.4 | 57.42 | 15 56.52 | 64.08 | 3 59.82 | 0.874 |
| Wed. | 13 | 11 26 54.93 | 8.977 | 3 34 20.1 | 57.59 | 15 56.78 | 64.07 | 4 20.83 | 0.877 |
| Thur. | 14 | 11 30 30.36 | 8.976 | 3 11 15.8 | 57.75 | 15 57.03 | 64.06 | 4 41.90 | 0.879 |
| Frid. | 15 | 11 34 5.75 | 8.975 | 2 48 7.5 | 57.90 | 15 57.29 | 64.06 | 5 3.00 | 0.880 |
| Sat. | 16 | 11 37 41.13 | 8.975 | 2 24 56.0 | 58.03 | 15 57.55 | 64.05 | 5 24.10 | 0.880 |
| *Sun.* | 17 | 11 41 16.53 | 8.975 | 2 1 41.7 | 58.15 | 15 57.82 | 64 05 | 5 45.20 | 0.879 |
| Mon. | 18 | 11 44 51.95 | 8.976 | 1 38 24.6 | 58.25 | 15 58.09 | 64.05 | 6 6.28 | 0.878 |
| Tues. | 19 | 11 48 27.39 | 8.978 | 1 15 5.4 | 58.33 | 15 58.36 | 64.06 | 6 27.34 | 0.876 |
| Wed. | 20 | 11 52 2.89 | 8.981 | 0 51 44.3 | 58.40 | 15 58.63 | 64.07 | 6 48.33 | 0.874 |
| Thur. | 21 | 11 55 38.47 | 8.984 | 0 28 21.8 | 58.46 | 15 58.90 | 64.09 | 7 9.24 | 0.871 |
| Frid. | 22 | 11 59 14.13 | 8.988 | N. 0 4 58.1 | 58.50 | 15 59.17 | 64.10 | 7 30.08 | 0.867 |
| Sat. | 23 | 12 2 49.89 | 8.992 | S. 0 18 26.3 | 58.52 | 15 59.45 | 64.12 | 7 50.83 | 0.862 |
| *Sun.* | 24 | 12 6 25.77 | 8.999 | 0 41 51.1 | 58.53 | 15 59.73 | 64.14 | 8 11.44 | 0.856 |
| Mon. | 25 | 12 10 1.80 | 9.005 | 1 5 16.0 | 58.53 | 16 0.01 | 64.17 | 8 31.90 | 0.849 |
| Tues. | 26 | 12 13 37.99 | 9.012 | 1 28 40.6 | 58.51 | 16 0.29 | 64.20 | 8 52.20 | 0.842 |
| Wed. | 27 | 12 17 14.36 | 9.020 | 1 52 4.5 | 58.47 | 16 0.57 | 64.23 | 9 12.33 | 0.834 |
| Thur. | 28 | 12 20 50.94 | 9.029 | 2 15 27.5 | 58.42 | 16 0.85 | 64.26 | 9 32.26 | 0.825 |
| Frid. | 29 | 12 24 27.75 | 9.039 | 2 38 49.2 | 58.36 | 16 1.13 | 64.30 | 9 51.95 | 0.815 |
| Sat. | 30 | 12 28 4.82 | 9.050 | 3 2 9.2 | 58.28 | 16 1.41 | 64.34 | 10 11.37 | 0.804 |
| *Sun.* | 31 | 12 31 42.17 | 9.062 | S. 3 25 27.1 | −58.20 | 16 1.69 | 64.39 | 10 30.53 | 0.793 |

**NOTE.—Mean Time of the Semidiameter passing may be found by subtracting $0^{s}.18$ from the Sidereal Time.**

**— prefixed to the hourly change of declination, indicates that north declinations are decreasing, and that south declinations are increasing.**

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, *to be added to Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
| | | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | | | |
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Frid. | 1 | 10 43 40.36 | 9.064 | N. 8 4 26.9 | -54.65 | 0 17.46 | 0.792 | 10 43 57.82 |
| Sat. | 2 | 10 47 17.74 | 9.052 | 7 42 31.5 | 54.90 | 0 36.63 | 0.804 | 10 47 54.37 |
| *Sun.* | 3 | 10 50 54.85 | 9.041 | 7 20 28.7 | 55.27 | 0 56.07 | 0.815 | 10 51 50.92 |
| Mon. | 4 | 10 54 31.71 | 9.031 | 6 58 18.8 | 55.56 | 1 15.76 | 0.825 | 10 55 47.47 |
| Tues. | 5 | 10 58 8.34 | 9.022 | 6 36 2.0 | 55.84 | 1 35.69 | 0.834 | 10 59 44.03 |
| Wed. | 6 | 11 1 44.76 | 9.014 | 6 13 38.6 | 56.11 | 1 55.82 | 0.842 | 11 3 40.58 |
| Thur. | 7 | 11 5 20.98 | 9.007 | 5 51 8.7 | 56.37 | 2 16.16 | 0.850 | 11 7 37.14 |
| Frid. | 8 | 11 8 57.04 | 9.000 | 5 28 33.0 | 56.61 | 2 36.65 | 0.856 | 11 11 33.69 |
| Sat. | 9 | 11 12 32.96 | 8.994 | 5 5 51.6 | 56.84 | 2 57.29 | 0.862 | 11 15 30.25 |
| *Sun.* | 10 | 11 16 8.76 | 8.989 | 4 43 5.0 | 57.06 | 3 18.04 | 0.867 | 11 19 26.80 |
| Mon. | 11 | 11 19 44.44 | 8.985 | 4 20 13.2 | 57.26 | 3 38.92 | 0.871 | 11 23 23.36 |
| Tues. | 12 | 11 23 20.04 | 8.982 | 3 57 16.6 | 57.44 | 3 59.87 | 0.874 | 11 27 19.91 |
| Wed. | 13 | 11 26 55.57 | 8.979 | 3 34 15.9 | 57.61 | 4 20.89 | 0.877 | 11 31 16.46 |
| Thur. | 14 | 11 30 31.05 | 8.978 | 3 11 11.2 | 57.77 | 4 41.96 | 0.879 | 11 35 13.01 |
| Frid. | 15 | 11 34 6.50 | 8.977 | 2 48 2.6 | 57.92 | 5 3.07 | 0.880 | 11 39 9.57 |
| Sat. | 16 | 11 37 41.94 | 8.977 | 2 24 50.8 | 58.05 | 5 24.18 | 0.880 | 11 43 6.12 |
| *Sun.* | 17 | 11 41 17.39 | 8.977 | 2 1 36.1 | 58.17 | 5 45.29 | 0.879 | 11 47 2.68 |
| Mon. | 18 | 11 44 52.86 | 8.978 | 1 38 18.7 | 58.27 | 6 6.37 | 0.878 | 11 50 59.23 |
| Tues. | 19 | 11 48 28.35 | 8.980 | 1 14 59.2 | 58.35 | 6 27.44 | 0.876 | 11 54 55.79 |
| Wed. | 20 | 11 52 3.91 | 8.983 | 0 51 37.7 | 58.42 | 6 48.43 | 0.874 | 11 58 52.34 |
| Thur. | 21 | 11 55 39.54 | 8.986 | 0 28 14.8 | 58.48 | 7 9.35 | 0.871 | 12 2 48.89 |
| Frid. | 22 | 11 59 15.25 | 8.990 | N. 0 4 50.8 | 58.52 | 7 30.19 | 0.867 | 12 6 45.44 |
| Sat. | 23 | 12 2 51.06 | 8.995 | S. 0 18 34.0 | 58.54 | 7 50.94 | 0.862 | 12 10 42.00 |
| *Sun.* | 24 | 12 6 27.00 | 9.001 | 0 41 59.1 | 58.55 | 8 11.55 | 0.856 | 12 14 38.55 |
| Mon. | 25 | 12 10 3.08 | 9.007 | 1 5 24.4 | 58.55 | 8 32.03 | 0.849 | 12 18 35.11 |
| Tues. | 26 | 12 13 39.33 | 9.014 | 1 28 49.3 | 58.53 | 8 52.33 | 0.842 | 12 22 31.66 |
| Wed. | 27 | 12 17 15.75 | 9.022 | 1 52 13.5 | 58.49 | 9 12.47 | 0.834 | 12 26 28.22 |
| Thur. | 28 | 12 20 52.38 | 9.031 | 2 15 36.8 | 58.44 | 9 32.39 | 0.825 | 12 30 24.77 |
| Frid. | 29 | 12 24 29.24 | 9.041 | 2 38 58.8 | 58.38 | 9 52.08 | 0.815 | 12 34 21.32 |
| Sat. | 30 | 12 28 6.36 | 9.052 | 3 2 19.1 | 58.30 | 10 11.51 | 0.804 | 12 38 17.87 |
| *Sun.* | 31 | 12 31 43.76 | 9.064 | S. 3 25 37.3 | -58.21 | 10 30.67 | 0.793 | 12 42 14.43 |

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing.

Diff. for 1 hour.
$+9^{\mathrm{s}}.8565$

## AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S *True* LONGITUDE. λ | THE SUN'S *True* LONGITUDE. λ′ | THE SUN'S Diff. for 1 hour. | THE SUN'S LATITUDE. | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 245 | 159 20 40.6 | 20 3.3 | 145.28 | −0.35 | 0.0036901 | −44.7 | 13 13 51.76 |
| 2 | 246 | 160 18 47.9 | 18 10.6 | 145.34 | 0.23 | .0035824 | 44.9 | 13 9 55.85 |
| 3 | 247 | 161 16 56.9 | 16 19.5 | 145.41 | −0.11 | .0034739 | 45.1 | 13 5 59.94 |
| 4 | 248 | 162 15 7.8 | 14 30.2 | 145.48 | +0.03 | .0033654 | 45.4 | 13 2 4.05 |
| 5 | 249 | 163 13 20.4 | 12 42.7 | 145.56 | 0.16 | .0032562 | 45.6 | 12 58 8.14 |
| 6 | 250 | 164 11 34.9 | 10 57.1 | 145.64 | 0.28 | .0031465 | 45.8 | 12 54 12.23 |
| 7 | 251 | 165 9 51.4 | 9 13.5 | 145.73 | 0.38 | .0030363 | 46.0 | 12 50 16.32 |
| 8 | 252 | 166 8 9.9 | 7 31.8 | 145.81 | 0.47 | .0029256 | 46.2 | 12 46 20.41 |
| 9 | 253 | 167 6 30.4 | 5 52.2 | 145.90 | 0.52 | .0028143 | 46.5 | 12 42 24.51 |
| 10 | 254 | 168 4 53.1 | 4 14.8 | 145.99 | 0.56 | .0027023 | 46.8 | 12 38 28.59 |
| 11 | 255 | 169 3 18.0 | 2 39.6 | 146.08 | 0.56 | .0025897 | 47.1 | 12 34 32.68 |
| 12 | 256 | 170 1 45.0 | 1 6.5 | 146.17 | 0.51 | .0024763 | 47.5 | 12 30 36.78 |
| 13 | 257 | 170 60 14.1 | 59 35.5 | 146.26 | 0.46 | .0023619 | 47.9 | 12 26 40.87 |
| 14 | 258 | 171 58 45.4 | 58 6.6 | 146.35 | 0.37 | .0022463 | 48.4 | 12 22 44.96 |
| 15 | 259 | 172 57 18.8 | 56 39.9 | 146.44 | 0.27 | .0021295 | 48.9 | 12 18 49.05 |
| 16 | 260 | 173 55 54.3 | 55 15.3 | 146.53 | 0.14 | .0020115 | 49.4 | 12 14 53.15 |
| 17 | 261 | 174 54 31.9 | 53 52.8 | 146.61 | +0.01 | .0018923 | 49.9 | 12 10 57.24 |
| 18 | 262 | 175 53 11.5 | 52 32.2 | 146.69 | −0.12 | .0017720 | 50.4 | 12 7 1.33 |
| 19 | 263 | 176 51 53.0 | 51 13.6 | 146.77 | 0.24 | .0016505 | 50.9 | 12 3 5.43 |
| 20 | 264 | 177 50 36.4 | 49 56.9 | 146.85 | 0.37 | .0015278 | 51.4 | 11 59 9.52 |
| 21 | 265 | 178 49 21.7 | 48 42.1 | 146.93 | 0.48 | .0014040 | 51.8 | 11 55 13.61 |
| 22 | 266 | 179 48 8.8 | 47 29.1 | 147.01 | 0.55 | .0012794 | 52.2 | 11 51 17.70 |
| 23 | 267 | 180 46 57.7 | 46 17.9 | 147.08 | 0.60 | .0011539 | 52.5 | 11 47 21.79 |
| 24 | 268 | 181 45 48.4 | 45 8.5 | 147.15 | 0.61 | .0010276 | 52.7 | 11 43 25.88 |
| 25 | 269 | 182 44 40.8 | 44 0.8 | 147.21 | 0.60 | .0009008 | 52.9 | 11 39 29.97 |
| 26 | 270 | 183 43 34.8 | 42 54.7 | 147.28 | 0.55 | .0007737 | 53.0 | 11 35 34.06 |
| 27 | 271 | 184 42 30.6 | 41 50.4 | 147.36 | 0.49 | .0006463 | 53.1 | 11 31 38.15 |
| 28 | 272 | 185 41 28.1 | 40 47.7 | 147.44 | 0.38 | .0005189 | 53.1 | 11 27 42.26 |
| 29 | 273 | 186 40 27.5 | 39 47.0 | 147.52 | 0.28 | .0003916 | 53.0 | 11 23 46.35 |
| 30 | 274 | 187 39 28.8 | 38 48.2 | 147.60 | 0.15 | .0002647 | 52.9 | 11 19 50.44 |
| 31 | 275 | 188 38 31.9 | 37 51.2 | 147.67 | −0.02 | 0.0001381 | −52.7 | 11 15 54.54 |

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
$-9^{s}.8296$

## GREENWICH MEAN TIME.

### THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | MERIDIAN PASSAGE. | | AGE. |
|---|---|---|---|---|---|---|---|---|---|
| | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. | | Diff. for 1 hour. | Noon. |
| | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 14 56.6 | 14 57.4 | 54 36.3 | +0.81 | 54 46.6 | +0.91 | 10 38.7 | 1.86 | 13.0 |
| 2 | 15 0.5 | 15 3.9 | 54 58.1 | 1.00 | 55 10.5 | 1.06 | 11 22.5 | 1.79 | 14.0 |
| 3 | 15 7.4 | 15 11.2 | 55 23.6 | 1.12 | 55 37.4 | 1.17 | 12 5.0 | 1.75 | 15.0 |
| 4 | 15 15.0 | 15 19.0 | 55 51.6 | 1.20 | 56 6.2 | 1.22 | 12 47.0 | 1.76 | 16.0 |
| 5 | 15 23.0 | 15 27.0 | 56 20.9 | 1.23 | 56 35.7 | 1.23 | 13 29.7 | 1.81 | 17.0 |
| 6 | 15 31.1 | 15 35.1 | 56 50.5 | 1.24 | 57 5.4 | 1.24 | 14 14.3 | 1.91 | 18.0 |
| 7 | 15 39.2 | 15 43.2 | 57 20.2 | 1.23 | 57 34.9 | 1.22 | 15 1.9 | 2.06 | 19.0 |
| 8 | 15 47.1 | 15 51.0 | 57 49.5 | 1.20 | 58 3.8 | 1.18 | 15 53.5 | 2.25 | 20.0 |
| 9 | 15 54.9 | 15 58.6 | 58 17.8 | 1.16 | 58 31.6 | 1.13 | 16 49.9 | 2.45 | 21.0 |
| 10 | 16 2.3 | 16 5.7 | 58 44.9 | 1.09 | 58 57.6 | 1.03 | 17 50.6 | 2.60 | 22.0 |
| 11 | 16 8.9 | 16 12.0 | 59 9.5 | 0.96 | 59 20.5 | 0.87 | 18 53.7 | 2.64 | 23.0 |
| 12 | 16 14.6 | 16 16.9 | 59 30.3 | 0.76 | 59 38.6 | 0.62 | 19 56.6 | 2.57 | 24.0 |
| 13 | 16 18.7 | 16 19.9 | 59 45.1 | 0.46 | 59 49.5 | +0.28 | 20 56.7 | 2.42 | 25.0 |
| 14 | 16 20.4 | 16 20.3 | 59 51.7 | +0.07 | 59 51.2 | −0.15 | 21 52.7 | 2.25 | 26.0 |
| 15 | 16 19.5 | 16 17.8 | 59 48.1 | −0.38 | 59 42.1 | 0.62 | 22 44.6 | 2.09 | 27.0 |
| 16 | 16 15.4 | 16 12.4 | 59 33.2 | 0.86 | 59 21.5 | 1.09 | 23 33.5 | 1.99 | 28.0 |
| 17 | 16 8.3 | 16 3.8 | 59 7.2 | 1.29 | 58 50.5 | 1.48 | δ | | |
| 18 | 15 58.6 | 15 53.0 | 58 31.7 | 1.65 | 58 11.1 | 1.77 | 0 20.5 | 1.93 | 0.6 |
| 19 | 15 47.1 | 15 40.9 | 57 49.3 | 1.86 | 57 26.6 | 1.91 | 1 6.8 | 1.93 | 1.6 |
| 20 | 15 34.7 | 15 28.4 | 57 3.6 | 1.92 | 56 40.7 | 1.89 | 1 53.5 | 1.97 | 2.6 |
| 21 | 15 22.3 | 15 16.5 | 56 18.3 | 1.83 | 55 56.9 | 1.73 | 2 41.4 | 2.03 | 3.6 |
| 22 | 15 11.0 | 15 6.0 | 55 36.9 | 1.60 | 55 18.5 | 1.45 | 3 31.0 | 2.10 | 4.6 |
| 23 | 15 1.6 | 14 57.7 | 55 2.1 | 1.28 | 54 47.9 | 1.09 | 4 22.2 | 2.16 | 5.6 |
| 24 | 14 54.5 | 14 52.0 | 54 36.0 | 0.89 | 54 26.6 | 0.68 | 5 14.4 | 2.18 | 6.6 |
| 25 | 14 50.0 | 14 48.9 | 54 19.7 | 0.46 | 54 15.5 | −0.25 | 6 6.5 | 2.15 | 7.6 |
| 26 | 14 48.4 | 14 48.7 | 54 13.8 | −0.03 | 54 14.7 | +0.18 | 6 57.3 | 2.08 | 8.6 |
| 27 | 14 49.6 | 14 51.2 | 54 18.1 | +0.38 | 54 23.9 | 0.58 | 7 46.1 | 1.99 | 9.6 |
| 28 | 14 53.4 | 14 56.2 | 54 32.0 | 0.77 | 54 42.2 | 0.93 | 8 32.7 | 1.90 | 10.6 |
| 29 | 14 59.5 | 15 3.3 | 54 54.3 | 1.09 | 55 8.2 | 1.22 | 9 17.1 | 1.82 | 11.6 |
| 30 | 15 7.4 | 15 11.8 | 55 23.5 | 1.32 | 55 39.8 | 1.39 | 10 0.1 | 1.77 | 12.6 |
| 31 | 15 16.5 | 15 21.3 | 55 56.8 | +1.45 | 56 14.5 | +1.49 | 10 42.6 | 1.77 | 13.6 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | FRIDAY 1. | | | | | SUNDAY 3. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 21 3 10.86 | 2.0084 | S. 20 11 17.6 | 10.731 | 0 | 22 36 10.04 | 1.8824 | S. 10 6 20.1 | 14.142 |
| 1 | 21 5 11.26 | 2.0049 | 20 0 31.0 | 10.822 | 1 | 22 38 2.94 | 1.8809 | 9 52 10.1 | 14.191 |
| 2 | 21 7 11.45 | 2.0015 | 19 49 39.0 | 10.912 | 2 | 22 39 55.75 | 1.8795 | 9 37 57.2 | 14.239 |
| 3 | 21 9 11.44 | 1.9982 | 19 38 41.6 | 11.002 | 3 | 22 41 48.48 | 1.8782 | 9 23 41.4 | 14.287 |
| 4 | 21 11 11.23 | 1.9948 | 19 27 38.8 | 11.091 | 4 | 22 43 41.13 | 1.8769 | 9 9 22.7 | 14.334 |
| 5 | 21 13 10.81 | 1.9913 | 19 16 30.7 | 11.178 | 5 | 22 45 33.71 | 1.8758 | 8 55 1.3 | 14.379 |
| 6 | 21 15 10.18 | 1.9879 | 19 5 17.4 | 11.265 | 6 | 22 47 26.22 | 1.8747 | 8 40 37.2 | 14.424 |
| 7 | 21 17 9.35 | 1.9846 | 18 53 58.9 | 11.352 | 7 | 22 49 18.67 | 1.8737 | 8 26 10.4 | 14.468 |
| 8 | 21 19 8.33 | 1.9813 | 18 42 35.2 | 11.437 | 8 | 22 51 11.06 | 1.8726 | 8 11 41.0 | 14.511 |
| 9 | 21 21 7.11 | 1.9781 | 18 31 6.4 | 11.522 | 9 | 22 53 3.38 | 1.8715 | 7 57 9.1 | 14.553 |
| 10 | 21 23 5.70 | 1.9748 | 18 19 32.6 | 11.605 | 10 | 22 54 55.64 | 1.8706 | 7 42 34.7 | 14.594 |
| 11 | 21 25 4.09 | 1.9716 | 18 7 53.8 | 11.687 | 11 | 22 56 47.85 | 1.8698 | 7 27 57.8 | 14.634 |
| 12 | 21 27 2.29 | 1.9684 | 17 56 10.1 | 11.769 | 12 | 22 58 40.02 | 1.8692 | 7 13 18.6 | 14.673 |
| 13 | 21 29 0.30 | 1.9653 | 17 44 21.5 | 11.851 | 13 | 23 0 32.15 | 1.8685 | 6 58 37.1 | 14.711 |
| 14 | 21 30 58.12 | 1.9622 | 17 32 28.0 | 11.932 | 14 | 23 2 24.24 | 1.8678 | 6 43 53.3 | 14.749 |
| 15 | 21 32 55.76 | 1.9591 | 17 20 29.7 | 12.011 | 15 | 23 4 16.29 | 1.8672 | 6 29 7.2 | 14.786 |
| 16 | 21 34 53.21 | 1.9560 | 17 8 26.7 | 12.089 | 16 | 23 6 8.30 | 1.8667 | 6 14 19.0 | 14.821 |
| 17 | 21 36 50.48 | 1.9530 | 16 56 19.0 | 12.167 | 17 | 23 8 0.29 | 1.8663 | 5 59 28.7 | 14.856 |
| 18 | 21 38 47.57 | 1.9501 | 16 44 6.7 | 12.243 | 18 | 23 9 52.26 | 1.8660 | 5 44 36.3 | 14.890 |
| 19 | 21 40 44.49 | 1.9472 | 16 31 49.8 | 12.319 | 19 | 23 11 44.21 | 1.8657 | 5 29 41.9 | 14.922 |
| 20 | 21 42 41.23 | 1.9443 | 16 19 28.4 | 12.394 | 20 | 23 13 36.14 | 1.8654 | 5 14 45.6 | 14.954 |
| 21 | 21 44 37.80 | 1.9414 | 16 7 2.5 | 12.469 | 21 | 23 15 28.06 | 1.8652 | 4 59 47.4 | 14.985 |
| 22 | 21 46 34.20 | 1.9386 | 15 54 32.1 | 12.543 | 22 | 23 17 19.97 | 1.8652 | 4 44 47.4 | 15.014 |
| 23 | 21 48 30.43 | 1.9358 | S. 15 41 57.3 | 12.616 | 23 | 23 19 11.88 | 1.8652 | S. 4 29 45.7 | 15.042 |
| | SATURDAY 2. | | | | | MONDAY 4. | | | |
| 0 | 21 50 26.50 | 1.9331 | S. 15 29 18.2 | 12.687 | 0 | 23 21 3.79 | 1.8652 | S. 4 14 42.4 | 15.069 |
| 1 | 21 52 22.40 | 1.9303 | 15 16 34.8 | 12.758 | 1 | 23 22 55.70 | 1.8653 | 3 59 37.4 | 15.097 |
| 2 | 21 54 18.14 | 1.9277 | 15 3 47.2 | 12.827 | 2 | 23 24 47.62 | 1.8655 | 3 44 30.7 | 15.124 |
| 3 | 21 56 13.73 | 1.9252 | 14 50 55.5 | 12.896 | 3 | 23 26 39.56 | 1.8658 | 3 29 22.5 | 15.148 |
| 4 | 21 58 9.17 | 1.9227 | 14 37 59.7 | 12.964 | 4 | 23 28 31.52 | 1.8661 | 3 14 12.9 | 15.172 |
| 5 | 22 0 4.46 | 1.9202 | 14 24 59.8 | 13.032 | 5 | 23 30 23.49 | 1.8664 | 2 59 1.9 | 15.195 |
| 6 | 22 1 59.60 | 1.9177 | 14 11 55.9 | 13.098 | 6 | 23 32 15.48 | 1.8669 | 2 43 49.5 | 15.217 |
| 7 | 22 3 54.59 | 1.9152 | 13 58 48.0 | 13.164 | 7 | 23 34 7.51 | 1.8675 | 2 28 35.8 | 15.238 |
| 8 | 22 5 49.43 | 1.9128 | 13 45 36.2 | 13.228 | 8 | 23 35 59.58 | 1.8682 | 2 13 20.9 | 15.258 |
| 9 | 22 7 44.13 | 1.9106 | 13 32 20.6 | 13.292 | 9 | 23 37 51.69 | 1.8688 | 1 58 4.8 | 15.277 |
| 10 | 22 9 38.70 | 1.9084 | 13 19 1.2 | 13.355 | 10 | 23 39 43.84 | 1.8695 | 1 42 47.6 | 15.295 |
| 11 | 22 11 33.14 | 1.9062 | 13 5 38.0 | 13.417 | 11 | 23 41 36.03 | 1.8703 | 1 27 29.4 | 15.311 |
| 12 | 22 13 27.45 | 1.9041 | 12 52 11.1 | 13.478 | 12 | 23 43 28.28 | 1.8712 | 1 12 10.3 | 15.327 |
| 13 | 22 15 21.63 | 1.9019 | 12 38 40.6 | 13.538 | 13 | 23 45 20.58 | 1.8722 | 0 56 50.2 | 15.343 |
| 14 | 22 17 15.68 | 1.8998 | 12 25 6.5 | 13.597 | 14 | 23 47 12.94 | 1.8733 | 0 41 29.2 | 15.357 |
| 15 | 22 19 9.61 | 1.8978 | 12 11 28.9 | 13.656 | 15 | 23 49 5.37 | 1.8744 | 0 26 7.4 | 15.369 |
| 16 | 22 21 3.42 | 1.8959 | 11 57 47.8 | 13.714 | 16 | 23 50 57.87 | 1.8756 | S. 0 10 44.9 | 15.381 |
| 17 | 22 22 57.12 | 1.8940 | 11 44 3.2 | 13.771 | 17 | 23 52 50.44 | 1.8768 | N. 0 4 38.3 | 15.392 |
| 18 | 22 24 50.70 | 1.8921 | 11 30 15.3 | 13.826 | 18 | 23 54 43.09 | 1.8782 | 0 20 2.1 | 15.402 |
| 19 | 22 26 44.17 | 1.8904 | 11 16 24.1 | 13.880 | 19 | 23 56 35.82 | 1.8796 | 0 35 26.5 | 15.411 |
| 20 | 22 28 37.54 | 1.8887 | 11 2 29.7 | 13.934 | 20 | 23 58 28.64 | 1.8811 | 0 50 51.4 | 15.418 |
| 21 | 22 30 30.81 | 1.8870 | 10 48 32.0 | 13.988 | 21 | 0 0 21.55 | 1.8827 | 1 6 16.7 | 15.425 |
| 22 | 22 32 23.98 | 1.8853 | 10 34 31.1 | 14.041 | 22 | 0 2 14.56 | 1.8843 | 1 21 42.4 | 15.431 |
| 23 | 22 34 17.05 | 1.8838 | 10 20 27.1 | 14.092 | 23 | 0 4 7.67 | 1.8860 | 1 37 8.4 | 15.435 |
| 24 | 22 36 10.04 | 1.8824 | S. 10 6 20.1 | 14.142 | 24 | 0 6 0.88 | 1.8878 | N. 1 52 34.6 | 15.438 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | TUESDAY 5. | | | | | THURSDAY 7. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 0 6 0.88 | 1.8878 | N. 1 52 34.6 | 15.438 | 0 | 1 40 11.03 | 2.0659 | N.13 55 52.0 | 14.228 |
| 1 | 0 7 54.20 | 1.8897 | 2 8 1.0 | 15.441 | 1 | 1 42 15.15 | 2.0715 | 14 10 4.0 | 14.171 |
| 2 | 0 9 47.64 | 1.8917 | 2 23 27.5 | 15.442 | 2 | 1 44 19.61 | 2.0771 | 14 24 12.5 | 14.112 |
| 3 | 0 11 41.20 | 1.8937 | 2 38 54.1 | 15.442 | 3 | 1 46 24.41 | 2.0828 | 14 38 17.4 | 14.052 |
| 4 | 0 13 34.89 | 1.8958 | 2 54 20.6 | 15.441 | 4 | 1 48 29.55 | 2.0886 | 14 52 18.7 | 13.990 |
| 5 | 0 15 28.70 | 1.8980 | 3 9 47.0 | 15.439 | 5 | 1 50 35.04 | 2.0945 | 15 6 16.2 | 13.928 |
| 6 | 0 17 22.65 | 1.9003 | 3 25 13.3 | 15.437 | 6 | 1 52 40.89 | 2.1005 | 15 20 10.0 | 13.864 |
| 7 | 0 19 16.74 | 1.9027 | 3 40 39.4 | 15.432 | 7 | 1 54 47.10 | 2.1065 | 15 33 59.9 | 13.798 |
| 8 | 0 21 10.97 | 1.9050 | 3 56 5.1 | 15.426 | 8 | 1 56 53.67 | 2.1126 | 15 47 45.8 | 13.731 |
| 9 | 0 23 5.34 | 1.9074 | 4 11 30.5 | 15.420 | 9 | 1 59 0.61 | 2.1187 | 16 1 27.6 | 13.662 |
| 10 | 0 24 59.86 | 1.9100 | 4 26 55.5 | 15.412 | 10 | 2 1 7.92 | 2.1249 | 16 15 5.2 | 13.592 |
| 11 | 0 26 54.54 | 1.9127 | 4 42 20.0 | 15.404 | 11 | 2 3 15.60 | 2.1312 | 16 28 38.6 | 13.521 |
| 12 | 0 28 49.39 | 1.9155 | 4 57 44.0 | 15.394 | 12 | 2 5 23.66 | 2.1375 | 16 42 7.7 | 13.448 |
| 13 | 0 30 44.40 | 1.9183 | 5 13 7.3 | 15.383 | 13 | 2 7 32.10 | 2.1439 | 16 55 32.4 | 13.373 |
| 14 | 0 32 39.58 | 1.9212 | 5 28 29.9 | 15.371 | 14 | 2 9 40.93 | 2.1504 | 17 8 52.5 | 13.297 |
| 15 | 0 34 34.94 | 1.9242 | 5 43 51.8 | 15.358 | 15 | 2 11 50.15 | 2.1569 | 17 22 8.0 | 13.219 |
| 16 | 0 36 30.48 | 1.9272 | 5 59 12.9 | 15.344 | 16 | 2 13 59.76 | 2.1634 | 17 35 18.8 | 13.140 |
| 17 | 0 38 26.20 | 1.9303 | 6 14 33.1 | 15.328 | 17 | 2 16 9.76 | 2.1700 | 17 48 24.8 | 13.059 |
| 18 | 0 40 22.11 | 1.9334 | 6 29 52.3 | 15.311 | 18 | 2 18 20.16 | 2.1767 | 18 1 25.9 | 12.977 |
| 19 | 0 42 18.21 | 1.9367 | 6 45 10.4 | 15.293 | 19 | 2 20 30.96 | 2.1834 | 18 14 22.0 | 12.893 |
| 20 | 0 44 14.51 | 1.9401 | 7 0 27.4 | 15.274 | 20 | 2 22 42.17 | 2.1902 | 18 27 13.0 | 12.808 |
| 21 | 0 46 11.02 | 1.9436 | 7 15 43.3 | 15.255 | 21 | 2 24 53.79 | 2.1971 | 18 39 58.9 | 12.721 |
| 22 | 0 48 7.74 | 1.9471 | 7 30 58.0 | 15.233 | 22 | 2 27 5.82 | 2.2040 | 18 52 39.5 | 12.632 |
| 23 | 0 50 4.67 | 1.9507 | N. 7 46 11.3 | 15.210 | 23 | 2 29 18.27 | 2.2109 | N.19 5 14.8 | 12.542 |
| | WEDNESDAY 6. | | | | | FRIDAY 8. | | | |
| 0 | 0 52 1.82 | 1.9543 | N. 8 1 23.2 | 15.186 | 0 | 2 31 31.13 | 2.2178 | N.19 17 44.6 | 12.451 |
| 1 | 0 53 59.19 | 1.9581 | 8 16 33.6 | 15.161 | 1 | 2 33 44.41 | 2.2249 | 19 30 8.9 | 12.357 |
| 2 | 0 55 56.79 | 1.9619 | 8 31 42.5 | 15.135 | 2 | 2 35 58.12 | 2.2321 | 19 42 27.5 | 12.262 |
| 3 | 0 57 54.62 | 1.9658 | 8 46 49.8 | 15.107 | 3 | 2 38 12.26 | 2.2392 | 19 54 40.3 | 12.165 |
| 4 | 0 59 52.69 | 1.9698 | 9 1 55.4 | 15.078 | 4 | 2 40 26.82 | 2.2463 | 20 6 47.3 | 12.067 |
| 5 | 1 1 51.00 | 1.9738 | 9 16 59.2 | 15.047 | 5 | 2 42 41.81 | 2.2535 | 20 18 48.3 | 11.967 |
| 6 | 1 3 49.55 | 1.9779 | 9 32 1.1 | 15.016 | 6 | 2 44 57.24 | 2.2607 | 20 30 43.3 | 11.865 |
| 7 | 1 5 48.35 | 1.9822 | 9 47 1.1 | 14.983 | 7 | 2 47 13.10 | 2.2680 | 20 42 32.1 | 11.762 |
| 8 | 1 7 47.41 | 1.9866 | 10 1 59.1 | 14.950 | 8 | 2 49 29.40 | 2.2752 | 20 54 14.7 | 11.658 |
| 9 | 1 9 46.74 | 1.9911 | 10 16 55.1 | 14.915 | 9 | 2 51 46.13 | 2.2825 | 21 5 51.0 | 11.552 |
| 10 | 1 11 46.34 | 1.9955 | 10 31 48.9 | 14.878 | 10 | 2 54 3.30 | 2.2898 | 21 17 20.9 | 11.443 |
| 11 | 1 13 46.20 | 1.9999 | 10 46 40.5 | 14.841 | 11 | 2 56 20.91 | 2.2972 | 21 28 44.2 | 11.333 |
| 12 | 1 15 46.33 | 2.0045 | 11 1 29.8 | 14.802 | 12 | 2 58 38.97 | 2.3047 | 21 40 0.8 | 11.221 |
| 13 | 1 17 46.74 | 2.0093 | 11 16 16.7 | 14.761 | 13 | 3 0 57.47 | 2.3121 | 21 51 10.7 | 11.108 |
| 14 | 1 19 47.44 | 2.0141 | 11 31 1.1 | 14.719 | 14 | 3 3 16.42 | 2.3195 | 22 2 13.8 | 10.993 |
| 15 | 1 21 48.43 | 2.0189 | 11 45 42.9 | 14.676 | 15 | 3 5 35.81 | 2.3269 | 22 13 9.9 | 10.877 |
| 16 | 1 23 49.71 | 2.0238 | 12 0 22.2 | 14.632 | 16 | 3 7 55.65 | 2.3344 | 22 23 59.0 | 10.758 |
| 17 | 1 25 51.29 | 2.0288 | 12 14 58.8 | 14.587 | 17 | 3 10 15.94 | 2.3419 | 22 34 40.9 | 10.638 |
| 18 | 1 27 53.17 | 2.0338 | 12 29 32.6 | 14.539 | 18 | 3 12 36.68 | 2.3493 | 22 45 15.6 | 10.517 |
| 19 | 1 29 55.35 | 2.0389 | 12 44 3.5 | 14.490 | 19 | 3 14 57.86 | 2.3567 | 22 55 42.9 | 10.393 |
| 20 | 1 31 57.84 | 2.0442 | 12 58 31.4 | 14.440 | 20 | 3 17 19.49 | 2.3642 | 23 6 2.8 | 10.269 |
| 21 | 1 34 0.65 | 2.0495 | 13 12 56.3 | 14.389 | 21 | 3 19 41.57 | 2.3717 | 23 16 15.2 | 10.143 |
| 22 | 1 36 3.78 | 2.0549 | 13 27 18.1 | 14.337 | 22 | 3 22 4.10 | 2.3792 | 23 26 20.0 | 10.015 |
| 23 | 1 38 7.24 | 2.0604 | 13 41 36.7 | 14.283 | 23 | 3 24 27.08 | 2.3867 | 23 36 17.0 | 9.884 |
| 24 | 1 40 11.03 | 2.0659 | N.13 55 52.0 | 14.228 | 24 | 3 26 50.50 | 2.3941 | N.23 46 6.1 | 9.753 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | **SATURDAY 9.** | | | | | **MONDAY 11.** | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 3 26 50.50 | 2.3941 | N.23 46 6.1 | 9.753 | 0 | 5 29 20.73 | 2.6735 | N.28 33 9.4 | 1.691 |
| 1 | 3 29 14.37 | 2.4016 | 23 55 47.3 | 9.620 | 1 | 5 32 1.23 | 2.6763 | 28 34 45.0 | 1.496 |
| 2 | 3 31 38.69 | 2.4090 | 24 5 20.5 | 9.485 | 2 | 5 34 41.89 | 2.6790 | 28 36 8.9 | 1.299 |
| 3 | 3 34 3.45 | 2.4163 | 24 14 45.5 | 9.348 | 3 | 5 37 22.71 | 2.6815 | 28 37 20.9 | 1.102 |
| 4 | 3 36 28.65 | 2.4237 | 24 24 2.3 | 9.210 | 4 | 5 40 3.67 | 2.6837 | 28 38 21.1 | 0.904 |
| 5 | 3 38 54.30 | 2.4311 | 24 33 10.7 | 9.069 | 5 | 5 42 44.76 | 2.6858 | 28 39 9.4 | 0.706 |
| 6 | 3 41 20.39 | 2.4384 | 24 42 10.6 | 8.927 | 6 | 5 45 25.97 | 2.6878 | 28 39 45.8 | 0.507 |
| 7 | 3 43 46.91 | 2.4457 | 24 51 2.0 | 8.785 | 7 | 5 48 7.30 | 2.6897 | 28 40 10.3 | 0.308 |
| 8 | 3 46 13.87 | 2.4530 | 24 59 44.8 | 8.641 | 8 | 5 50 48.73 | 2.6913 | 28 40 22.8 | +0.109 |
| 9 | 3 48 41.27 | 2.4602 | 25 8 18.9 | 8.494 | 9 | 5 53 30.25 | 2.6927 | 28 40 23.4 | −0.090 |
| 10 | 3 51 9.10 | 2.4674 | 25 16 44.1 | 8.346 | 10 | 5 56 11.85 | 2.6939 | 28 40 12.0 | 0.290 |
| 11 | 3 53 37.36 | 2.4745 | 25 25 0.4 | 8.197 | 11 | 5 58 53.52 | 2.6950 | 28 39 48.6 | 0.490 |
| 12 | 3 56 6.04 | 2.4816 | 25 33 7.7 | 8.046 | 12 | 6 1 35.25 | 2.6959 | 28 39 13.2 | 0.691 |
| 13 | 3 58 35.15 | 2.4887 | 25 41 5.9 | 7.893 | 13 | 6 4 17.03 | 2.6966 | 28 38 25.7 | 0.892 |
| 14 | 4 1 4.68 | 2.4956 | 25 48 54.9 | 7.739 | 14 | 6 6 58.84 | 2.6971 | 28 37 26.2 | 1.092 |
| 15 | 4 3 34.62 | 2.5024 | 25 56 34.6 | 7.583 | 15 | 6 9 40.68 | 2.6974 | 28 36 14.7 | 1.293 |
| 16 | 4 6 4.97 | 2.5093 | 26 4 4.9 | 7.425 | 16 | 6 12 22.53 | 2.6976 | 28 34 51.1 | 1.494 |
| 17 | 4 8 35.73 | 2.5161 | 26 11 25.6 | 7.265 | 17 | 6 15 4.39 | 2.6976 | 28 33 15.4 | 1.695 |
| 18 | 4 11 6.90 | 2.5228 | 26 18 36.7 | 7.105 | 18 | 6 17 46.24 | 2.6973 | 28 31 27.7 | 1.896 |
| 19 | 4 13 38.47 | 2.5295 | 26 25 38.2 | 6.943 | 19 | 6 20 28.07 | 2.6969 | 28 29 27.9 | 2.097 |
| 20 | 4 16 10.44 | 2.5361 | 26 32 29.9 | 6.780 | 20 | 6 23 9.87 | 2.6964 | 28 27 16.1 | 2.297 |
| 21 | 4 18 42.80 | 2.5425 | 26 39 11.8 | 6.615 | 21 | 6 25 51.64 | 2.6957 | 28 24 52.3 | 2.497 |
| 22 | 4 21 15.54 | 2.5488 | 26 45 43.7 | 6.448 | 22 | 6 28 33.36 | 2.6948 | 28 22 16.5 | 2.697 |
| 23 | 4 23 48.66 | 2.5552 | N.26 52 5.6 | 6.281 | 23 | 6 31 15.02 | 2.6937 | N.28 19 28.7 | 2.897 |
| | **SUNDAY 10.** | | | | | **TUESDAY 12.** | | | |
| 0 | 4 26 22.16 | 2.5614 | N.26 58 17.4 | 6.112 | 0 | 6 33 56.60 | 2.6923 | N.28 16 28.9 | 3.096 |
| 1 | 4 28 56.03 | 2.5675 | 27 4 19.0 | 5.941 | 1 | 6 36 38.10 | 2.6909 | 28 13 17.2 | 3.295 |
| 2 | 4 31 30.26 | 2.5735 | 27 10 10.3 | 5.768 | 2 | 6 39 19.51 | 2.6893 | 28 9 53.5 | 3.495 |
| 3 | 4 34 4.85 | 2.5794 | 27 15 51.2 | 5.595 | 3 | 6 42 0.82 | 2.6876 | 28 6 17.8 | 3.694 |
| 4 | 4 36 39.79 | 2.5852 | 27 21 21.7 | 5.421 | 4 | 6 44 42.02 | 2.6856 | 28 2 30.2 | 3.892 |
| 5 | 4 39 15.07 | 2.5908 | 27 26 41.7 | 5.245 | 5 | 6 47 23.09 | 2.6834 | 27 58 30.8 | 4.088 |
| 6 | 4 41 50.69 | 2.5964 | 27 31 51.1 | 5.067 | 6 | 6 50 4.03 | 2.6812 | 27 54 19.6 | 4.285 |
| 7 | 4 44 26.64 | 2.6019 | 27 36 49.8 | 4.889 | 7 | 6 52 44.83 | 2.6788 | 27 49 56.6 | 4.482 |
| 8 | 4 47 2.92 | 2.6072 | 27 41 37.8 | 4.709 | 8 | 6 55 25.48 | 2.6762 | 27 45 21.8 | 4.677 |
| 9 | 4 49 39.51 | 2.6124 | 27 46 14.9 | 4.528 | 9 | 6 58 5.97 | 2.6733 | 27 40 35.3 | 4.672 |
| 10 | 4 52 16.41 | 2.6175 | 27 50 41.1 | 4.346 | 10 | 7 0 46.28 | 2.6703 | 27 35 37.2 | 5.065 |
| 11 | 4 54 53.61 | 2.6224 | 27 54 56.4 | 4.163 | 11 | 7 3 26.41 | 2.6672 | 27 30 27.5 | 5.258 |
| 12 | 4 57 31.10 | 2.6272 | 27 59 0.7 | 3.979 | 12 | 7 6 6.35 | 2.6640 | 27 25 6.3 | 5.450 |
| 13 | 5 0 8.88 | 2.6319 | 28 2 53.9 | 3.793 | 13 | 7 8 46.09 | 2.6607 | 27 19 33.5 | 5.642 |
| 14 | 5 2 46.93 | 2.6364 | 28 6 35.9 | 3.606 | 14 | 7 11 25.63 | 2.6572 | 27 13 49.2 | 5.833 |
| 15 | 5 5 25.25 | 2.6408 | 28 10 6.6 | 3.418 | 15 | 7 14 4.95 | 2.6534 | 27 7 53.5 | 6.023 |
| 16 | 5 8 3.83 | 2.6451 | 28 13 26.0 | 3.230 | 16 | 7 16 44.04 | 2.6496 | 27 1 46.4 | 6.212 |
| 17 | 5 10 42.66 | 2.6492 | 28 16 34.2 | 3.042 | 17 | 7 19 22.90 | 2.6457 | 26 55 28.0 | 6.400 |
| 18 | 5 13 21.74 | 2.6532 | 28 19 31.0 | 2.851 | 18 | 7 22 1.52 | 2.6416 | 26 48 58.4 | 6.587 |
| 19 | 5 16 1.05 | 2.6570 | 28 22 16.3 | 2.659 | 19 | 7 24 39.89 | 2.6374 | 26 42 17.6 | 6.772 |
| 20 | 5 18 40.58 | 2.6606 | 28 24 50.1 | 2.467 | 20 | 7 27 18.01 | 2.6331 | 26 35 25.7 | 6.957 |
| 21 | 5 21 20.32 | 2.6641 | 28 27 12.4 | 2.275 | 21 | 7 29 55.86 | 2.6285 | 26 28 22.7 | 7.141 |
| 22 | 5 24 0.27 | 2.6674 | 28 29 23.1 | 2.081 | 22 | 7 32 33.43 | 2.6239 | 26 21 8.8 | 7.323 |
| 23 | 5 26 40.41 | 2.6705 | 28 31 22.1 | 1.886 | 23 | 7 35 10.72 | 2.6192 | 26 13 44.0 | 7.504 |
| 24 | 5 29 20.73 | 2.6735 | N.28 33 9.4 | 1.691 | 24 | 7 37 47.73 | 2.6143 | N.26 6 8.3 | 7.685 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | WEDNESDAY 13. | | | | | FRIDAY 15. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 7 37 47.73 | 2.6143 | N.26 6 8.3 | 7.685 | 0 | 9 36 23.92 | 2.3169 | N.16 59 33.9 | 14.415 |
| 1 | 7 40 24.44 | 2.6093 | 25 58 21.8 | 7.863 | 1 | 9 38 42.74 | 2.3106 | 16 45 6.1 | 14.510 |
| 2 | 7 43 0.85 | 2.6043 | 25 50 24.7 | 8.039 | 2 | 9 41 1.19 | 2.3044 | 16 30 32.7 | 14.603 |
| 3 | 7 45 36.96 | 2.5992 | 25 42 17.1 | 8.214 | 3 | 9 43 19.27 | 2.2983 | 16 15 53.8 | 14.694 |
| 4 | 7 48 12.76 | 2.5940 | 25 33 59.0 | 8.389 | 4 | 9 45 36.98 | 2.2922 | 16 1 9.4 | 14.783 |
| 5 | 7 50 48.24 | 2.5887 | 25 25 30.4 | 8.563 | 5 | 9 47 54.33 | 2.2861 | 15 46 19.8 | 14.870 |
| 6 | 7 53 23.40 | 2.5833 | 25 16 51.4 | 8.735 | 6 | 9 50 11.31 | 2.2800 | 15 31 25.0 | 14.956 |
| 7 | 7 55 58.23 | 2.5777 | 25 8 2.2 | 8.905 | 7 | 9 52 27.93 | 2.2741 | 15 16 25.1 | 15.039 |
| 8 | 7 58 32.72 | 2.5720 | 24 59 2.8 | 9.074 | 8 | 9 54 44.20 | 2.2682 | 15 1 20.3 | 15.121 |
| 9 | 8 1 6.87 | 2.5663 | 24 49 53.3 | 9.242 | 9 | 9 57 0.11 | 2.2623 | 14 46 10.6 | 15.201 |
| 10 | 8 3 40.68 | 2.5606 | 24 40 33.8 | 9.407 | 10 | 9 59 15.67 | 2.2564 | 14 30 56.2 | 15.279 |
| 11 | 8 6 14.14 | 2.5547 | 24 31 4.4 | 9.571 | 11 | 10 1 30.88 | 2.2507 | 14 15 37.2 | 15.355 |
| 12 | 8 8 47.24 | 2.5487 | 24 21 25.3 | 9.733 | 12 | 10 3 45.75 | 2.2450 | 14 0 13.6 | 15.429 |
| 13 | 8 11 19.98 | 2.5427 | 24 11 36.4 | 9.895 | 13 | 10 6 0.28 | 2.2393 | 13 44 45.7 | 15.501 |
| 14 | 8 13 52.37 | 2.5367 | 24 1 37.9 | 10.055 | 14 | 10 8 14.47 | 2.2337 | 13 29 13.5 | 15.571 |
| 15 | 8 16 24.39 | 2.5306 | 23 51 29.8 | 10.213 | 15 | 10 10 28.33 | 2.2282 | 13 13 37.2 | 15.638 |
| 16 | 8 18 56.04 | 2.5244 | 23 41 12.3 | 10.369 | 16 | 10 12 41.86 | 2.2228 | 12 57 56.9 | 15.704 |
| 17 | 8 21 27.32 | 2.5182 | 23 30 45.5 | 10.523 | 17 | 10 14 55.07 | 2.2174 | 12 42 12.7 | 15.769 |
| 18 | 8 23 58.23 | 2.5120 | 23 20 9.5 | 10.676 | 18 | 10 17 7.95 | 2.2120 | 12 26 24.6 | 15.832 |
| 19 | 8 26 28.76 | 2.5057 | 23 9 24.4 | 10.827 | 19 | 10 19 20.51 | 2.2068 | 12 10 32.8 | 15.892 |
| 20 | 8 28 58.91 | 2.4993 | 22 58 30.2 | 10.977 | 20 | 10 21 32.76 | 2.2017 | 11 54 37.5 | 15.951 |
| 21 | 8 31 28.67 | 2.4928 | 22 47 27.1 | 11.125 | 21 | 10 23 44.71 | 2.1966 | 11 38 38.7 | 16.008 |
| 22 | 8 33 58.04 | 2.4863 | 22 36 15.2 | 11.271 | 22 | 10 25 56.35 | 2.1915 | 11 22 36.5 | 16.063 |
| 23 | 8 36 27.03 | 2.4799 | N.22 24 54.6 | 11.415 | 23 | 10 28 7.69 | 2.1865 | N.11 6 31.1 | 16.117 |
| | THURSDAY 14. | | | | | SATURDAY 16. | | | |
| 0 | 8 38 55.63 | 2.4734 | N.22 13 25.4 | 11.557 | 0 | 10 30 18.73 | 2.1816 | N.10 50 22.5 | 16.168 |
| 1 | 8 41 23.84 | 2.4669 | 22 1 47.7 | 11.698 | 1 | 10 32 29.48 | 2.1767 | 10 34 10.9 | 16.218 |
| 2 | 8 43 51.66 | 2.4603 | 21 50 1.6 | 11.837 | 2 | 10 34 39.94 | 2.1719 | 10 17 56.4 | 16.266 |
| 3 | 8 46 19.08 | 2.4538 | 21 38 7.3 | 11.974 | 3 | 10 36 50.11 | 2.1672 | 10 1 39.0 | 16.312 |
| 4 | 8 48 46.11 | 2.4473 | 21 26 4.8 | 12.109 | 4 | 10 39 0.00 | 2.1626 | 9 45 19.0 | 16.355 |
| 5 | 8 51 12.75 | 2.4407 | 21 13 54.2 | 12.242 | 5 | 10 41 9.62 | 2.1581 | 9 28 56.4 | 16.397 |
| 6 | 8 53 38.99 | 2.4340 | 21 1 35.7 | 12.373 | 6 | 10 43 18.97 | 2.1537 | 9 12 31.3 | 16.438 |
| 7 | 8 56 4.83 | 2.4274 | 20 49 9.4 | 12.503 | 7 | 10 45 28.06 | 2.1493 | 8 56 3.8 | 16.477 |
| 8 | 8 58 30.28 | 2.4208 | 20 36 35.4 | 12.631 | 8 | 10 47 36.89 | 2.1450 | 8 39 34.1 | 16.513 |
| 9 | 9 0 55.33 | 2.4142 | 20 23 53.7 | 12.757 | 9 | 10 49 45.46 | 2.1408 | 8 23 2.2 | 16.549 |
| 10 | 9 3 19.98 | 2.4076 | 20 11 4.5 | 12.881 | 10 | 10 51 53.78 | 2.1366 | 8 6 28.2 | 16.582 |
| 11 | 9 5 44.24 | 2.4010 | 19 58 8.0 | 13.003 | 11 | 10 54 1.85 | 2.1324 | 7 49 52.3 | 16.614 |
| 12 | 9 8 8.10 | 2.3943 | 19 45 4.2 | 13.123 | 12 | 10 56 9.67 | 2.1283 | 7 33 14.5 | 16.644 |
| 13 | 9 10 31.56 | 2.3877 | 19 31 53.3 | 13.241 | 13 | 10 58 17.25 | 2.1244 | 7 16 35.0 | 16.672 |
| 14 | 9 12 54.63 | 2.3812 | 19 18 35.3 | 13.357 | 14 | 11 0 24.60 | 2.1207 | 6 59 53.9 | 16.698 |
| 15 | 9 15 17.31 | 2.3747 | 19 5 10.4 | 13.472 | 15 | 11 2 31.73 | 2.1170 | 6 43 11.2 | 16.723 |
| 16 | 9 17 39.60 | 2.3682 | 18 51 38.7 | 13.584 | 16 | 11 4 38.64 | 2.1133 | 6 26 27.1 | 16.746 |
| 17 | 9 20 1.49 | 2.3616 | 18 38 0.3 | 13.695 | 17 | 11 6 45.33 | 2.1097 | 6 9 41.7 | 16.767 |
| 18 | 9 22 22.99 | 2.3552 | 18 24 15.3 | 13.803 | 18 | 11 8 51.81 | 2.1062 | 5 52 55.1 | 16.786 |
| 19 | 9 24 44.11 | 2.3487 | 18 10 23.9 | 13.910 | 19 | 11 10 58.07 | 2.1026 | 5 36 7.4 | 16.804 |
| 20 | 9 27 4.84 | 2.3422 | 17 56 26.1 | 14.015 | 20 | 11 13 4.12 | 2.0992 | 5 19 18.6 | 16.821 |
| 21 | 9 29 25.18 | 2.3358 | 17 42 22.1 | 14.117 | 21 | 11 15 9.97 | 2.0959 | 5 2 28.9 | 16.835 |
| 22 | 9 31 45.14 | 2.3295 | 17 28 12.0 | 14.218 | 22 | 11 17 15.63 | 2.0927 | 4 45 38.4 | 16.847 |
| 23 | 9 34 4.72 | 2.3232 | 17 13 55.9 | 14.317 | 23 | 11 19 21.10 | 2.0897 | 4 28 47.2 | 16.858 |
| 24 | 9 36 23.92 | 2.3169 | N.16 59 33.9 | 14.415 | 24 | 11 21 26.39 | 2.0867 | N. 4 11 55.4 | 16.868 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | SUNDAY 17. | | | | | TUESDAY 19. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 11 21 26.39 | 2.0867 | N. 4 11 55.4 | 16.868 | 0 | 12 59 36.52 | 2.0330 | S. 8 59 36.1 | 15.568 |
| 1 | 11 23 31.50 | 2.0837 | 3 55 3.1 | 16.876 | 1 | 13 1 38.52 | 2.0337 | 9 15 8.4 | 15.508 |
| 2 | 11 25 36.44 | 2.0808 | 3 38 10.3 | 16.882 | 2 | 13 3 40.57 | 2.0345 | 9 30 37.1 | 15.448 |
| 3 | 11 27 41.20 | 2.0779 | 3 21 17.2 | 16.887 | 3 | 13 5 42.66 | 2.0352 | 9 46 2.1 | 15.386 |
| 4 | 11 29 45.79 | 2.0752 | 3 4 23.9 | 16.890 | 4 | 13 7 44.79 | 2.0359 | 10 1 23.4 | 15.322 |
| 5 | 11 31 50.22 | 2.0726 | 2 47 30.4 | 16.892 | 5 | 13 9 46.97 | 2.0368 | 10 16 40.8 | 15.257 |
| 6 | 11 33 54.50 | 2.0701 | 2 30 36.9 | 16.891 | 6 | 13 11 49.21 | 2.0378 | 10 31 54.2 | 15.190 |
| 7 | 11 35 58.63 | 2.0676 | 2 13 43.5 | 16.889 | 7 | 13 13 51.51 | 2.0389 | 10 47 3.6 | 15.123 |
| 8 | 11 38 2.61 | 2.0652 | 1 56 50.2 | 16.887 | 8 | 13 15 53.88 | 2.0401 | 11 2 9.0 | 15.056 |
| 9 | 11 40 6.45 | 2.0629 | 1 39 57.1 | 16.882 | 9 | 13 17 56.32 | 2.0412 | 11 17 10.3 | 14.987 |
| 10 | 11 42 10.16 | 2.0607 | 1 23 4.4 | 16.874 | 10 | 13 19 58.83 | 2.0424 | 11 32 7.4 | 14.917 |
| 11 | 11 44 13.74 | 2.0586 | 1 6 12.2 | 16.865 | 11 | 13 22 1.41 | 2.0437 | 11 47 0.3 | 14.845 |
| 12 | 11 46 17.19 | 2.0564 | 0 49 20.6 | 16.855 | 12 | 13 24 4.07 | 2.0450 | 12 1 48.8 | 14.772 |
| 13 | 11 48 20.51 | 2.0544 | 0 32 29.6 | 16.845 | 13 | 13 26 6.81 | 2.0464 | 12 16 32.9 | 14.698 |
| 14 | 11 50 23.72 | 2.0526 | N. 0 15 39.2 | 16.833 | 14 | 13 28 9.64 | 2.0478 | 12 31 12.6 | 14.624 |
| 15 | 11 52 26.82 | 2.0508 | S. 0 1 10.4 | 16.819 | 15 | 13 30 12.55 | 2.0493 | 12 45 47.8 | 14.548 |
| 16 | 11 54 29.81 | 2.0490 | 0 17 59.1 | 16.803 | 16 | 13 32 15.55 | 2.0508 | 13 0 18.4 | 14.471 |
| 17 | 11 56 32.70 | 2.0473 | 0 34 46.8 | 16.787 | 17 | 13 34 18.65 | 2.0524 | 13 14 44.3 | 14.393 |
| 18 | 11 58 35.49 | 2.0457 | 0 51 33.5 | 16.768 | 18 | 13 36 21.84 | 2.0540 | 13 29 5.6 | 14.315 |
| 19 | 12 0 38.19 | 2.0442 | 1 8 19.0 | 16.748 | 19 | 13 38 25.13 | 2.0557 | 13 43 22.1 | 14.234 |
| 20 | 12 2 40.80 | 2.0428 | 1 25 3.3 | 16.727 | 20 | 13 40 28.53 | 2.0575 | 13 57 33.7 | 14.152 |
| 21 | 12 4 43.33 | 2.0415 | 1 41 46.2 | 16.703 | 21 | 13 42 32.03 | 2.0593 | 14 11 40.4 | 14.070 |
| 22 | 12 6 45.78 | 2.0402 | 1 58 27.7 | 16.679 | 22 | 13 44 35.64 | 2.0611 | 14 25 42.1 | 13.987 |
| 23 | 12 8 48.15 | 2.0389 | S. 2 15 7.7 | 16.652 | 23 | 13 46 39.36 | 2.0630 | S. 14 39 38.8 | 13.902 |
| | MONDAY 18. | | | | | WEDNESDAY 20. | | | |
| 0 | 12 10 50.45 | 2.0378 | S. 2 31 46.0 | 16.624 | 0 | 13 48 43.20 | 2.0649 | S. 14 53 30.4 | 13.817 |
| 1 | 12 12 52.69 | 2.0368 | 2 48 22.6 | 16.596 | 1 | 13 50 47.15 | 2.0669 | 15 7 16.8 | 13.730 |
| 2 | 12 14 54.87 | 2.0358 | 3 4 57.5 | 16.567 | 2 | 13 52 51.22 | 2.0689 | 15 20 58.0 | 13.643 |
| 3 | 12 16 56.99 | 2.0349 | 3 21 30.6 | 16.536 | 3 | 13 54 55.42 | 2.0710 | 15 34 34.0 | 13.556 |
| 4 | 12 18 59.06 | 2.0342 | 3 38 1.8 | 16.503 | 4 | 13 56 59.74 | 2.0731 | 15 48 4.7 | 13.467 |
| 5 | 12 21 1.09 | 2.0334 | 3 54 31.0 | 16.469 | 5 | 13 59 4.19 | 2.0752 | 16 1 30.0 | 13.376 |
| 6 | 12 23 3.07 | 2.0327 | 4 10 58.1 | 16.433 | 6 | 14 1 8.77 | 2.0774 | 16 14 49.8 | 13.284 |
| 7 | 12 25 5.01 | 2.0321 | 4 27 23.0 | 16.396 | 7 | 14 3 13.48 | 2.0796 | 16 28 4.1 | 13.192 |
| 8 | 12 27 6.92 | 2.0316 | 4 43 45.6 | 16.357 | 8 | 14 5 18.32 | 2.0818 | 16 41 12.8 | 13.098 |
| 9 | 12 29 8.81 | 2.0312 | 5 0 5.9 | 16.317 | 9 | 14 7 23.29 | 2.0840 | 16 54 15.9 | 13.004 |
| 10 | 12 31 10.67 | 2.0308 | 5 16 23.7 | 16.277 | 10 | 14 9 28.40 | 2.0864 | 17 7 13.3 | 12.909 |
| 11 | 12 33 12.51 | 2.0305 | 5 32 39.1 | 16.235 | 11 | 14 11 33.66 | 2.0888 | 17 20 5.0 | 12.813 |
| 12 | 12 35 14.33 | 2.0303 | 5 48 51.9 | 16.191 | 12 | 14 13 39.06 | 2.0912 | 17 32 50.9 | 12.716 |
| 13 | 12 37 16.14 | 2.0302 | 6 5 2.0 | 16.146 | 13 | 14 15 44.60 | 2.0936 | 17 45 30.9 | 12.618 |
| 14 | 12 39 17.95 | 2.0301 | 6 21 9.4 | 16.100 | 14 | 14 17 50.29 | 2.0961 | 17 58 5.1 | 12.520 |
| 15 | 12 41 19.75 | 2.0300 | 6 37 14.0 | 16.052 | 15 | 14 19 56.13 | 2.0986 | 18 10 33.3 | 12.420 |
| 16 | 12 43 21.55 | 2.0301 | 6 53 15.7 | 16.003 | 16 | 14 22 2.12 | 2.1011 | 18 22 55.5 | 12.319 |
| 17 | 12 45 23.36 | 2.0302 | 7 9 14.4 | 15.953 | 17 | 14 24 8.26 | 2.1036 | 18 35 11.6 | 12.217 |
| 18 | 12 47 25.18 | 2.0304 | 7 25 10.1 | 15.902 | 18 | 14 26 14.55 | 2.1061 | 18 47 21.5 | 12.114 |
| 19 | 12 49 27.01 | 2.0307 | 7 41 2.6 | 15.849 | 19 | 14 28 20.99 | 2.1086 | 18 59 25.3 | 12.012 |
| 20 | 12 51 28.86 | 2.0310 | 7 56 51.9 | 15.795 | 20 | 14 30 27.58 | 2.1112 | 19 11 22.9 | 11.908 |
| 21 | 12 53 30.73 | 2.0314 | 8 12 38.0 | 15.741 | 21 | 14 32 34.33 | 2.1138 | 19 23 14.2 | 11.803 |
| 22 | 12 55 32.63 | 2.0319 | 8 28 20.8 | 15.685 | 22 | 14 34 41.24 | 2.1165 | 19 34 59.2 | 11.697 |
| 23 | 12 57 34.56 | 2.0324 | 8 44 0.2 | 15.627 | 23 | 14 36 48.31 | 2.1192 | 19 46 37.8 | 11.590 |
| 24 | 12 59 36.52 | 2.0330 | S. 8 59 36.1 | 15.568 | 24 | 14 38 55.54 | 2.1218 | S. 19 58 10.0 | 11.482 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | | | THURSDAY 21. | | | | | SATURDAY 23. | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 14 38 55.54 | 2.1218 | S. 19 58 10.0 | 11.482 | 0 | 16 23 50.25 | 2.2421 | S. 26 51 31.9 | 5.505 |
| 1 | 14 41 2.93 | 2.1245 | 20 9 35.7 | 11.374 | 1 | 16 26 4.83 | 2.2438 | 26 56 58.1 | 5.368 |
| 2 | 14 43 10.48 | 2.1272 | 20 20 54.9 | 11.265 | 2 | 16 28 19.51 | 2.2455 | 27 2 16.1 | 5.231 |
| 3 | 14 45 18.20 | 2.1300 | 20 32 7.5 | 11.155 | 3 | 16 30 34.29 | 2.2472 | 27 7 25.8 | 5.093 |
| 4 | 14 47 26.08 | 2.1327 | 20 43 13.5 | 11.044 | 4 | 16 32 49.17 | 2.2488 | 27 12 27.2 | 4.954 |
| 5 | 14 49 34.12 | 2.1354 | 20 54 12.8 | 10.932 | 5 | 16 35 4.14 | 2.2503 | 27 17 20.3 | 4.815 |
| 6 | 14 51 42.33 | 2.1382 | 21 5 5.3 | 10.819 | 6 | 16 37 19.20 | 2.2517 | 27 22 5.0 | 4.676 |
| 7 | 14 53 50.70 | 2.1409 | 21 15 51.1 | 10.706 | 7 | 16 39 34.34 | 2.2530 | 27 26 41.4 | 4.537 |
| 8 | 14 55 59.24 | 2.1437 | 21 26 30.1 | 10.593 | 8 | 16 41 49.56 | 2.2543 | 27 31 9.4 | 4.398 |
| 9 | 14 58 7.95 | 2.1465 | 21 37 2.2 | 10.478 | 9 | 16 44 4.86 | 2.2556 | 27 35 29.1 | 4.258 |
| 10 | 15 0 16.82 | 2.1492 | 21 47 27.4 | 10.363 | 10 | 16 46 20.24 | 2.2569 | 27 39 40.4 | 4.117 |
| 11 | 15 2 25.86 | 2.1520 | 21 57 45.7 | 10.246 | 11 | 16 48 35.69 | 2.2581 | 27 43 43.2 | 3.977 |
| 12 | 15 4 35.06 | 2.1548 | 22 7 57.0 | 10.129 | 12 | 16 50 51.21 | 2.2592 | 27 47 37.6 | 3.837 |
| 13 | 15 6 44.42 | 2.1576 | 22 18 1.2 | 10.012 | 13 | 16 53 6.79 | 2.2602 | 27 51 23.6 | 3.696 |
| 14 | 15 8 53.97 | 2.1603 | 22 27 58.4 | 9.893 | 14 | 16 55 22.43 | 2.2611 | 27 55 1.1 | 3.555 |
| 15 | 15 11 3.67 | 2.1631 | 22 37 48.4 | 9.773 | 15 | 16 57 38.12 | 2.2619 | 27 58 30.2 | 3.414 |
| 16 | 15 13 13.54 | 2.1658 | 22 47 31.2 | 9.653 | 16 | 16 59 53.86 | 2.2628 | 28 1 50.8 | 3.273 |
| 17 | 15 15 23.57 | 2.1686 | 22 57 6.8 | 9.533 | 17 | 17 2 9.65 | 2.2636 | 28 5 3.0 | 3.132 |
| 18 | 15 17 33.77 | 2.1713 | 23 6 35.2 | 9.412 | 18 | 17 4 25.49 | 2.2642 | 28 8 6.7 | 2.991 |
| 19 | 15 19 44.13 | 2.1741 | 23 15 56.3 | 9.290 | 19 | 17 6 41.36 | 2.2648 | 28 11 1.9 | 2.849 |
| 20 | 15 21 54.66 | 2.1768 | 23 25 10.0 | 9.168 | 20 | 17 8 57.27 | 2.2654 | 28 13 48.6 | 2.707 |
| 21 | 15 24 5.35 | 2.1795 | 23 34 16.4 | 9.045 | 21 | 17 11 13.21 | 2.2659 | 28 16 26.8 | 2.566 |
| 22 | 15 26 16.20 | 2.1822 | 23 43 15.4 | 8.921 | 22 | 17 13 29.18 | 2.2663 | 28 18 56.5 | 2.424 |
| 23 | 15 28 27.21 | 2.1848 | S. 23 52 6.9 | 8.796 | 23 | 17 15 45.17 | 2.2666 | S. 28 21 17.7 | 2.282 |
| | | | FRIDAY 22. | | | | | SUNDAY 24. | |
| 0 | 15 30 38.38 | 2.1875 | S. 24 0 50.9 | 8.671 | 0 | 17 18 1.17 | 2.2668 | S. 28 23 30.3 | 2.139 |
| 1 | 15 32 49.71 | 2.1902 | 24 9 27.4 | 8.545 | 1 | 17 20 17.19 | 2.2671 | 28 25 34.4 | 1.997 |
| 2 | 15 35 1.20 | 2.1928 | 24 17 56.3 | 8.418 | 2 | 17 22 33.22 | 2.2672 | 28 27 30.0 | 1.856 |
| 3 | 15 37 12.84 | 2.1953 | 24 26 17.6 | 8.290 | 3 | 17 24 49.25 | 2.2671 | 28 29 17.1 | 1.714 |
| 4 | 15 39 24.64 | 2.1979 | 24 34 31.3 | 8.164 | 4 | 17 27 5.27 | 2.2670 | 28 30 55.7 | 1.572 |
| 5 | 15 41 36.59 | 2.2005 | 24 42 37.3 | 8.036 | 5 | 17 29 21.29 | 2.2670 | 28 32 25.8 | 1.431 |
| 6 | 15 43 48.70 | 2.2031 | 24 50 35.6 | 7.907 | 6 | 17 31 37.31 | 2.2669 | 28 33 47.4 | 1.289 |
| 7 | 15 46 0.96 | 2.2055 | 24 58 26.2 | 7.778 | 7 | 17 33 53.32 | 2.2667 | 28 35 0.5 | 1.147 |
| 8 | 15 48 13.36 | 2.2079 | 25 6 9.0 | 7.648 | 8 | 17 36 9.31 | 2.2663 | 28 36 5.0 | 1.004 |
| 9 | 15 50 25.91 | 2.2103 | 25 13 43.9 | 7.517 | 9 | 17 38 25.28 | 2.2659 | 28 37 1.0 | 0.862 |
| 10 | 15 52 38.60 | 2.2128 | 25 21 11.0 | 7.387 | 10 | 17 40 41.22 | 2.2654 | 28 37 48.5 | 0.721 |
| 11 | 15 54 51.44 | 2.2152 | 25 28 30.3 | 7.256 | 11 | 17 42 57.13 | 2.2648 | 28 38 27.5 | 0.579 |
| 12 | 15 57 4.42 | 2.2174 | 25 35 41.7 | 7.124 | 12 | 17 45 13.00 | 2.2642 | 28 38 58.0 | 0.438 |
| 13 | 15 59 17.53 | 2.2197 | 25 42 45.2 | 6.992 | 13 | 17 47 28.83 | 2.2635 | 28 39 20.0 | 0.297 |
| 14 | 16 1 30.78 | 2.2220 | 25 49 40.7 | 6.858 | 14 | 17 49 44.62 | 2.2627 | 28 39 33.6 | 0.156 |
| 15 | 16 3 44.17 | 2.2242 | 25 56 28.2 | 6.725 | 15 | 17 52 0.36 | 2.2619 | 28 39 38.7 | −0.014 |
| 16 | 16 5 57.69 | 2.2264 | 26 3 7.7 | 6.591 | 16 | 17 54 16.05 | 2.2610 | 28 39 35.3 | +0.127 |
| 17 | 16 8 11.34 | 2.2285 | 26 9 39.1 | 6.456 | 17 | 17 56 31.68 | 2.2599 | 28 39 23.5 | 0.267 |
| 18 | 16 10 25.11 | 2.2306 | 26 16 2.4 | 6.322 | 18 | 17 58 47.24 | 2.2588 | 28 39 3.3 | 0.407 |
| 19 | 16 12 39.01 | 2.2327 | 26 22 17.7 | 6.187 | 19 | 18 1 2.74 | 2.2577 | 28 38 34.6 | 0.548 |
| 20 | 16 14 53.03 | 2.2347 | 26 28 24.9 | 6.052 | 20 | 18 3 18.17 | 2.2566 | 28 37 57.5 | 0.688 |
| 21 | 16 17 7.17 | 2.2366 | 26 34 23.9 | 5.916 | 21 | 18 5 33.58 | 2.2553 | 28 37 12.1 | 0.827 |
| 22 | 16 19 21.42 | 2.2384 | 26 40 14.8 | 5.780 | 22 | 18 7 48.81 | 2.2539 | 28 36 18.3 | 0.967 |
| 23 | 16 21 35.78 | 2.2403 | 26 45 57.5 | 5.643 | 23 | 18 10 4.00 | 2.2524 | 28 35 16.1 | 1.107 |
| 24 | 16 23 50.25 | 2.2421 | S. 26 51 31.9 | 5.505 | 24 | 18 12 19.10 | 2.2509 | S. 28 34 5.5 | 1.946 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | **MONDAY 25.** | | | | | **WEDNESDAY 27.** | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 18 12 19.10 | 2.2509 | S. 28 34 5.5 | 1.246 | 0 | 19 57 31.92 | 2.1160 | S. 25 1 45.0 | 7.402 |
| 1 | 18 14 34.11 | 2.2494 | 28 32 46.6 | 1.385 | 1 | 19 59 38.77 | 2.1123 | 24 54 17.4 | 7.517 |
| 2 | 18 16 49.03 | 2.2478 | 28 31 19.3 | 1.523 | 2 | 20 1 45.40 | 2.1087 | 24 46 43.0 | 7.631 |
| 3 | 18 19 3.85 | 2.2461 | 28 29 43.8 | 1.661 | 3 | 20 3 51.81 | 2.1050 | 24 39 1.7 | 7.745 |
| 4 | 18 21 18.56 | 2.2443 | 28 28 0.0 | 1.799 | 4 | 20 5 58.00 | 2.1014 | 24 31 13.6 | 7.857 |
| 5 | 18 23 33.16 | 2.2424 | 28 26 7.9 | 1.937 | 5 | 20 8 3.98 | 2.0978 | 24 23 18.8 | 7.968 |
| 6 | 18 25 47.65 | 2.2405 | 28 24 7.6 | 2.074 | 6 | 20 10 9.74 | 2.0942 | 24 15 17.4 | 8.078 |
| 7 | 18 28 2.02 | 2.2385 | 28 21 59.1 | 2.211 | 7 | 20 12 15.28 | 2.0905 | 24 7 9.4 | 8.188 |
| 8 | 18 30 16.27 | 2.2365 | 28 19 42.3 | 2.347 | 8 | 20 14 20.60 | 2.0867 | 23 58 54.8 | 8.298 |
| 9 | 18 32 30.40 | 2.2345 | 28 17 17.4 | 2.483 | 9 | 20 16 25.69 | 2.0830 | 23 50 33.6 | 8.407 |
| 10 | 18 34 44.41 | 2.2324 | 28 14 44.3 | 2.619 | 10 | 20 18 30.56 | 2.0793 | 23 42 6.0 | 8.514 |
| 11 | 18 36 58.29 | 2.2302 | 28 12 3.1 | 2.754 | 11 | 20 20 35.21 | 2.0757 | 23 33 31.9 | 8.622 |
| 12 | 18 39 12.03 | 2.2278 | 28 9 13.8 | 2.889 | 12 | 20 22 39.64 | 2.0720 | 23 24 51.4 | 8.728 |
| 13 | 18 41 25.63 | 2.2255 | 28 6 16.4 | 3.024 | 13 | 20 24 43.85 | 2.0683 | 23 16 4.5 | 8.834 |
| 14 | 18 43 39.09 | 2.2231 | 28 3 10.9 | 3.158 | 14 | 20 26 47.84 | 2.0647 | 23 7 11.3 | 8.939 |
| 15 | 18 45 52.40 | 2.2207 | 27 59 57.4 | 3.292 | 15 | 20 28 51.61 | 2.0611 | 22 58 11.8 | 9.043 |
| 16 | 18 48 5.57 | 2.2182 | 27 56 35.9 | 3.425 | 16 | 20 30 55.17 | 2.0575 | 22 49 6.1 | 9.147 |
| 17 | 18 50 18.59 | 2.2157 | 27 53 6.4 | 3.557 | 17 | 20 32 58.51 | 2.0538 | 22 39 54.2 | 9.250 |
| 18 | 18 52 31.45 | 2.2130 | 27 49 29.0 | 3.689 | 18 | 20 35 1.63 | 2.0502 | 22 30 36.1 | 9.352 |
| 19 | 18 54 44.15 | 2.2103 | 27 45 43.7 | 3.821 | 19 | 20 37 4.53 | 2.0466 | 22 21 11.9 | 9.453 |
| 20 | 18 56 56.69 | 2.2076 | 27 41 50.5 | 3.952 | 20 | 20 39 7.22 | 2.0430 | 22 11 41.7 | 9.554 |
| 21 | 18 59 9.06 | 2.2048 | 27 37 49.4 | 4.084 | 21 | 20 41 9.69 | 2.0393 | 22 2 5.4 | 9.655 |
| 22 | 19 1 21.26 | 2.2019 | 27 33 40.4 | 4.215 | 22 | 20 43 11.94 | 2.0357 | 21 52 23.1 | 9.754 |
| 23 | 19 3 33.29 | 2.1991 | S. 27 29 23.6 | 4.345 | 23 | 20 45 13.98 | 2.0322 | S. 21 42 34.9 | 9.852 |
| | **TUESDAY 26.** | | | | | **THURSDAY 28.** | | | |
| 0 | 19 5 45.15 | 2.1962 | S. 27 24 59.0 | 4.474 | 0 | 20 47 15.81 | 2.0287 | S. 21 32 40.9 | 9.949 |
| 1 | 19 7 56.84 | 2.1933 | 27 20 26.7 | 4.602 | 1 | 20 49 17.43 | 2.0252 | 21 22 41.0 | 10.047 |
| 2 | 19 10 8.35 | 2.1903 | 27 15 46.7 | 4.730 | 2 | 20 51 18.84 | 2.0217 | 21 12 35.3 | 10.143 |
| 3 | 19 12 19.67 | 2.1872 | 27 10 59.1 | 4.858 | 3 | 20 53 20.04 | 2.0182 | 21 2 23.8 | 10.239 |
| 4 | 19 14 30.81 | 2.1841 | 27 6 3.8 | 4.986 | 4 | 20 55 21.03 | 2.0147 | 20 52 6.6 | 10.333 |
| 5 | 19 16 41.76 | 2.1810 | 27 1 0.8 | 5.113 | 5 | 20 57 21.81 | 2.0113 | 20 41 43.8 | 10.428 |
| 6 | 19 18 52.53 | 2.1779 | 26 55 50.2 | 5.239 | 6 | 20 59 22.39 | 2.0080 | 20 31 15.3 | 10.522 |
| 7 | 19 21 3.11 | 2.1747 | 26 50 32.1 | 5.364 | 7 | 21 1 22.77 | 2.0047 | 20 20 41.2 | 10.614 |
| 8 | 19 23 13.49 | 2.1714 | 26 45 6.5 | 5.488 | 8 | 21 3 22.95 | 2.0013 | 20 10 1.6 | 10.705 |
| 9 | 19 25 23.68 | 2.1682 | 26 39 33.5 | 5.613 | 9 | 21 5 22.93 | 1.9980 | 19 59 16.6 | 10.796 |
| 10 | 19 27 33.67 | 2.1648 | 26 33 53.0 | 5.737 | 10 | 21 7 22.71 | 1.9947 | 19 48 26.1 | 10.887 |
| 11 | 19 29 43.46 | 2.1615 | 26 28 5.1 | 5.860 | 11 | 21 9 22.29 | 1.9913 | 19 37 30.2 | 10.976 |
| 12 | 19 31 53.05 | 2.1582 | 26 22 9.8 | 5.982 | 12 | 21 11 21.67 | 1.9881 | 19 26 29.0 | 11.064 |
| 13 | 19 34 2.44 | 2.1548 | 26 16 7.2 | 6.105 | 13 | 21 13 20.86 | 1.9849 | 19 15 22.5 | 11.152 |
| 14 | 19 36 11.62 | 2.1513 | 26 9 57.2 | 6.227 | 14 | 21 15 19.86 | 1.9818 | 19 4 10.7 | 11.240 |
| 15 | 19 38 20.60 | 2.1479 | 26 3 40.0 | 6.347 | 15 | 21 17 18.67 | 1.9787 | 18 52 53.7 | 11.327 |
| 16 | 19 40 29.37 | 2.1444 | 25 57 15.6 | 6.467 | 16 | 21 19 17.30 | 1.9756 | 18 41 31.5 | 11.413 |
| 17 | 19 42 37.93 | 2.1409 | 25 50 44.0 | 6.586 | 17 | 21 21 15.74 | 1.9725 | 18 30 4.2 | 11.497 |
| 18 | 19 44 46.28 | 2.1374 | 25 44 5.3 | 6.704 | 18 | 21 23 14.00 | 1.9695 | 18 18 31.9 | 11.580 |
| 19 | 19 46 54.42 | 2.1339 | 25 37 19.5 | 6.823 | 19 | 21 25 12.08 | 1.9665 | 18 6 54.6 | 11.663 |
| 20 | 19 49 2.35 | 2.1304 | 25 30 26.6 | 6.941 | 20 | 21 27 9.98 | 1.9636 | 17 55 12.3 | 11.747 |
| 21 | 19 51 10.07 | 2.1268 | 25 23 26.6 | 7.058 | 21 | 21 29 7.71 | 1.9607 | 17 43 25.0 | 11.829 |
| 22 | 19 53 17.57 | 2.1232 | 25 16 19.6 | 7.174 | 22 | 21 31 5.26 | 1.9577 | 17 31 32.8 | 11.910 |
| 23 | 19 55 24.85 | 2.1196 | 25 9 5.7 | 7.288 | 23 | 21 33 2.63 | 1.9548 | 17 19 35.8 | 11.990 |
| 24 | 19 57 31.92 | 2.1160 | S. 25 1 45.0 | 7.402 | 24 | 21 34 59.83 | 1.9520 | S. 17 7 34.0 | 12.069 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| FRIDAY 29. | | | | | SATURDAY 30. | | | | |
| . | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 21 34 59.83 | 1.9520 | S. 17 7 34.0 | 12.069 | 0 | 22 21 9.43 | 1.8995 | S. 11 56 57.7 | 13.737 |
| 1 | 21 36 56.87 | 1.9493 | 16 55 27.5 | 12.148 | 1 | 22 23 3.35 | 1.8979 | 11 43 11.7 | 13.796 |
| 2 | 21 38 53.75 | 1.9467 | 16 43 16.3 | 12.226 | 2 | 22 24 57.18 | 1.8965 | 11 29 22.2 | 13.854 |
| 3 | 21 40 50.47 | 1.9440 | 16 31 0.4 | 12.303 | 3 | 22 26 50.93 | 1.8951 | 11 15 29.2 | 13.912 |
| 4 | 21 42 47.03 | 1.9413 | 16 18 39.9 | 12.380 | 4 | 22 28 44.59 | 1.8937 | 11 1 32.8 | 13.968 |
| 5 | 21 44 43.43 | 1.9387 | 16 6 14.8 | 12.455 | 5 | 22 30 38.17 | 1.8924 | 10 47 33.0 | 14.024 |
| 6 | 21 46 39.68 | 1.9362 | 15 53 45.3 | 12.529 | 6 | 22 32 31.68 | 1.8912 | 10 33 29.9 | 14.079 |
| 7 | 21 48 35.78 | 1.9337 | 15 41 11.3 | 12.603 | 7 | 22 34 25.12 | 1.8901 | 10 19 23.5 | 14.134 |
| 8 | 21 50 31.73 | 1.9313 | 15 28 32.9 | 12.677 | 8 | 22 36 18.49 | 1.8889 | 10 5 13.8 | 14.188 |
| 9 | 21 52 27.54 | 1.9290 | 15 15 50.1 | 12.749 | 9 | 22 38 11.79 | 1.8878 | 9 51 0.9 | 14.241 |
| 10 | 21 54 23.21 | 1.9267 | 15 3 3.0 | 12.820 | 10 | 22 40 5.03 | 1.8869 | 9 36 44.9 | 14.292 |
| 11 | 21 56 18.74 | 1.9244 | 14 50 11.7 | 12.891 | 11 | 22 41 58.22 | 1.8861 | 9 22 25.9 | 14.342 |
| 12 | 21 58 14.14 | 1.9222 | 14 37 16.1 | 12.962 | 12 | 22 43 51.36 | 1.8852 | 9 8 3.9 | 14.392 |
| 13 | 22 0 9.40 | 1.9199 | 14 24 16.3 | 13.031 | 13 | 22 45 44.45 | 1.8844 | 8 53 38.9 | 14.441 |
| 14 | 22 2 4.53 | 1.9178 | 14 11 12.4 | 13.098 | 14 | 22 47 37.49 | 1.8837 | 8 39 11.0 | 14.489 |
| 15 | 22 3 59.54 | 1.9157 | 13 58 4.5 | 13.165 | 15 | 22 49 30.49 | 1.8830 | 8 24 40.2 | 14.537 |
| 16 | 22 5 54.42 | 1.9137 | 13 44 52.6 | 13.232 | 16 | 22 51 23.45 | 1.8824 | 8 10 6.6 | 14.583 |
| 17 | 22 7 49.18 | 1.9117 | 13 31 36.6 | 13.299 | 17 | 22 53 16.38 | 1.8819 | 7 55 30.3 | 14.628 |
| 18 | 22 9 43.83 | 1.9098 | 13 18 16.7 | 13.364 | 18 | 22 55 9.28 | 1.8815 | 7 40 51.3 | 14.672 |
| 19 | 22 11 38.36 | 1.9079 | 13 4 52.9 | 13.428 | 19 | 22 57 2.16 | 1.8811 | 7 26 9.7 | 14.716 |
| 20 | 22 13 32.78 | 1.9061 | 12 51 25.3 | 13.491 | 20 | 22 58 55.01 | 1.8807 | 7 11 25.4 | 14.759 |
| 21 | 22 15 27.09 | 1.9043 | 12 37 54.0 | 13.554 | 21 | 23 0 47.84 | 1.8804 | 6 56 38.6 | 14.801 |
| 22 | 22 17 21.30 | 1.9027 | 12 24 18.9 | 13.616 | 22 | 23 2 40.66 | 1.8802 | 6 41 49.3 | 14.842 |
| 23 | 22 19 15.41 | 1.9011 | 12 10 40.1 | 13.677 | 23 | 23 4 33.47 | 1.8801 | 6 26 57.6 | 14.881 |
| 24 | 22 21 9.43 | 1.8995 | S. 11 56 57.7 | 13.737 | 24 | 23 6 26.27 | 1.8800 | S. 6 12 3.6 | 14.919 |

## PHASES OF THE MOON.

| | d | h | m |
|---|---|---|---|
| ○ Full Moon, . . . . . . . . . . | 3 | 9 | 13.2 |
| ☾ Last Quarter, . . . . . . . . . . | 10 | 16 | 21.1 |
| ● New Moon, . . . . . . . . . . | 17 | 9 | 54.6 |
| ☽ First Quarter, . . . . . . . . . . | 25 | 0 | 3.1 |

| | d | h |
|---|---|---|
| ☾ Perigee, . . . . . . . . . . . . . . | 14 | 3.9 |
| ☾ Apogee, . . . . . . . . . . . . . . | 26 | 1.9 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Jupiter | W. | 77° 29′ 23″ | 3036 | 78° 58′ 51″ | 3028 | 80° 28′ 29″ | 3021 | 81° 58′ 16″ | 3013 |
| | Antares | W. | 64 10 20 | 2972 | 65 41 8 | 2964 | 67 12 6 | 2957 | 68 43 13 | 2949 |
| | α Pegasi | E. | 44 51 0 | 3515 | 43 30 53 | 3539 | 42 11 12 | 3566 | 40 52 1 | 3598 |
| | α Arietis | E. | 84 14 30 | 2997 | 82 44 14 | 2989 | 81 13 48 | 2982 | 79 43 13 | 2974 |
| 2 | Jupiter | W. | 89 29 43 | 2971 | 91 0 32 | 2963 | 92 31 31 | 2954 | 94 2 41 | 2946 |
| | Antares | W. | 76 21 20 | 2908 | 77 53 29 | 2899 | 79 25 49 | 2891 | 80 58 20 | 2882 |
| | α Arietis | E. | 72 7 52 | 2935 | 70 36 18 | 2927 | 69 4 34 | 2920 | 67 32 40 | 2911 |
| | Aldebaran | E. | 103 14 35 | 2986 | 101 44 5 | 2977 | 100 13 24 | 2968 | 98 42 31 | 2959 |
| 3 | Jupiter | W. | 101 41 16 | 2902 | 103 13 32 | 2894 | 104 45 59 | 2885 | 106 18 37 | 2876 |
| | Antares | W. | 88 43 44 | 2838 | 90 17 23 | 2828 | 91 51 14 | 2819 | 93 25 17 | 2811 |
| | α Aquilæ | W. | 46 32 58 | 4629 | 47 34 58 | 4531 | 48 38 23 | 4439 | 49 43 9 | 4355 |
| | α Arietis | E. | 59 50 35 | 2872 | 58 17 40 | 2863 | 56 44 34 | 2855 | 55 11 18 | 2848 |
| | Aldebaran | E. | 91 5 12 | 2912 | 89 33 9 | 2904 | 88 0 55 | 2894 | 86 28 29 | 2886 |
| 4 | Jupiter | W. | 114 4 35 | 2833 | 115 38 20 | 2825 | 117 12 15 | 2817 | 118 46 21 | 2808 |
| | Antares | W. | 101 18 27 | 2765 | 102 53 41 | 2756 | 104 29 7 | 2747 | 106 4 44 | 2738 |
| | α Aquilæ | W. | 55 24 37 | 4017 | 56 36 0 | 3961 | 57 48 18 | 3911 | 59 1 27 | 3863 |
| | α Arietis | E. | 47 22 37 | 2812 | 45 48 25 | 2806 | 44 14 5 | 2800 | 42 39 37 | 2795 |
| | Aldebaran | E. | 78 43 33 | 2844 | 77 10 2 | 2835 | 75 36 20 | 2826 | 74 2 28 | 2820 |
| 5 | α Aquilæ | W. | 65 18 27 | 3666 | 66 35 50 | 3634 | 67 53 48 | 3603 | 69 12 19 | 3575 |
| | Fomalhaut | W. | 36 48 21 | 3464 | 38 9 25 | 3402 | 39 31 39 | 3345 | 40 54 58 | 3294 |
| | Saturn | W. | 28 13 59 | 2669 | 29 51 21 | 2660 | 31 28 54 | 2651 | 33 6 40 | 2643 |
| | Aldebaran | E. | 66 10 45 | 2785 | 64 35 57 | 2779 | 63 1 1 | 2772 | 61 25 57 | 2767 |
| | Pollux | E. | 109 6 24 | 2697 | 107 29 40 | 2688 | 105 52 44 | 2679 | 104 15 36 | 2670 |
| | Venus | E. | 116 27 16 | 3022 | 114 57 31 | 3012 | 113 27 33 | 3001 | 111 57 22 | 2991 |
| 6 | α Aquilæ | W. | 75 52 7 | 3456 | 77 13 20 | 3437 | 78 34 55 | 3419 | 79 56 50 | 3402 |
| | Fomalhaut | W. | 48 4 57 | 3096 | 49 33 12 | 3065 | 51 2 5 | 3036 | 52 31 33 | 3009 |
| | Saturn | W. | 41 18 22 | 2600 | 42 57 17 | 2591 | 44 36 24 | 2583 | 46 15 43 | 2574 |
| | Aldebaran | E. | 53 28 55 | 2744 | 51 53 14 | 2741 | 50 17 29 | 2739 | 48 41 41 | 2737 |
| | Pollux | E. | 96 6 59 | 2627 | 94 28 41 | 2618 | 92 50 11 | 2610 | 91 11 29 | 2601 |
| | Venus | E. | 104 23 19 | 2942 | 102 51 53 | 2933 | 101 20 16 | 2924 | 99 48 27 | 2914 |
| 7 | α Aquilæ | W. | 86 50 43 | 3337 | 88 14 12 | 3327 | 89 37 52 | 3319 | 91 1 42 | 3311 |
| | Fomalhaut | W. | 60 6 41 | 2897 | 61 39 4 | 2878 | 63 11 51 | 2860 | 64 45 1 | 2843 |
| | Saturn | W. | 54 35 8 | 2533 | 56 15 35 | 2525 | 57 56 14 | 2517 | 59 37 4 | 2508 |
| | α Pegasi | W. | 39 5 54 | 3218 | 40 31 42 | 3166 | 41 58 32 | 3119 | 43 26 18 | 3076 |
| | Aldebaran | E. | 40 42 32 | 2744 | 39 6 51 | 2750 | 37 31 18 | 2758 | 35 55 55 | 2768 |
| | Pollux | E. | 82 55 10 | 2560 | 81 15 20 | 2551 | 79 35 18 | 2543 | 77 55 5 | 2535 |
| | Venus | E. | 92 6 28 | 2869 | 90 33 30 | 2861 | 89 0 21 | 2852 | 87 27 1 | 2844 |
| | Sun | E. | 136 47 36 | 2884 | 135 14 57 | 2876 | 133 42 7 | 2867 | 132 9 6 | 2858 |
| 8 | α Aquilæ | W. | 98 2 35 | 3291 | 99 26 57 | 3292 | 100 51 18 | 3293 | 102 15 38 | 3295 |
| | Fomalhaut | W. | 72 36 0 | 2769 | 74 11 8 | 2757 | 75 46 32 | 2745 | 77 22 12 | 2733 |
| | Saturn | W. | 68 4 6 | 2468 | 69 46 4 | 2460 | 71 28 14 | 2452 | 73 10 35 | 2444 |
| | α Pegasi | W. | 50 57 2 | 2909 | 52 29 10 | 2882 | 54 1 52 | 2856 | 55 35 7 | 2833 |
| | Pollux | E. | 69 31 11 | 2494 | 67 49 50 | 2487 | 66 8 18 | 2479 | 64 26 35 | 2471 |
| | Venus | E. | 79 37 37 | 2802 | 78 3 12 | 2794 | 76 28 36 | 2786 | 74 53 50 | 2779 |
| | Regulus | E. | 106 21 20 | 2493 | 104 39 57 | 2485 | 102 58 22 | 2477 | 101 16 36 | 2468 |
| | Sun | E. | 124 21 7 | 2814 | 122 46 57 | 2805 | 121 12 36 | 2797 | 119 38 4 | 2788 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Jupiter | W. | 83° 28′ 13″ | 3005 | 84° 58′ 20″ | 2997 | 86° 28′ 37″ | 2988 | 87° 59′ 5″ | 2980 |
| | Antares | W. | 70 14 30 | 2941 | 71 45 57 | 2933 | 73 17 34 | 2924 | 74 49 22 | 2916 |
| | α Pegasi | E. | 39 33 24 | 3633 | 38 15 25 | 3674 | 36 58 10 | 3720 | 35 41 44 | 3773 |
| | α Arietis | E. | 78 12 28 | 2967 | 76 41 34 | 2959 | 75 10 30 | 2951 | 73 39 16 | 2943 |
| 2 | Jupiter | W. | 95 34 2 | 2937 | 97 5 34 | 2928 | 98 37 17 | 2920 | 100 9 11 | 2911 |
| | Antares | W. | 82 31 2 | 2873 | 84 3 55 | 2864 | 85 37 0 | 2855 | 87 10 16 | 2846 |
| | α Arietis | E. | 66 0 35 | 2903 | 64 28 20 | 2895 | 62 55 55 | 2887 | 61 23 20 | 2880 |
| | Aldebaran | E. | 97 11 27 | 2950 | 95 40 11 | 2940 | 94 8 43 | 2931 | 92 37 3 | 2922 |
| 3 | Jupiter | W. | 107 51 27 | 2867 | 109 24 28 | 2859 | 110 57 39 | 2851 | 112 31 1 | 2842 |
| | Antares | W. | 94 59 31 | 2801 | 96 33 57 | 2792 | 98 8 35 | 2783 | 99 43 25 | 2774 |
| | α Aquilæ | W. | 50 49 11 | 4277 | 51 56 25 | 4205 | 53 4 46 | 4138 | 54 14 11 | 4075 |
| | α Arietis | E. | 53 37 53 | 2841 | 52 4 18 | 2834 | 50 30 34 | 2826 | 48 56 40 | 2819 |
| | Aldebaran | E. | 84 55 52 | 2876 | 83 23 3 | 2869 | 81 50 4 | 2860 | 80 16 54 | 2852 |
| 4 | Jupiter | W. | 120 20 38 | 2801 | 121 55 5 | 2792 | 123 29 43 | 2785 | 125 4 31 | 2776 |
| | Antares | W. | 107 40 33 | 2729 | 109 16 34 | 2720 | 110 52 47 | 2711 | 112 29 12 | 2703 |
| | α Aquilæ | W. | 60 15 24 | 3819 | 61 30 7 | 3777 | 62 45 33 | 3738 | 64 1 40 | 3700 |
| | α Arietis | E. | 41 5 2 | 2789 | 39 30 20 | 2785 | 37 55 32 | 2780 | 36 20 38 | 2777 |
| | Aldebaran | E. | 72 28 26 | 2813 | 70 54 15 | 2805 | 69 19 54 | 2798 | 67 45 24 | 2792 |
| 5 | α Aquilæ | W. | 70 31 21 | 3547 | 71 50 53 | 3523 | 73 10 52 | 3499 | 74 31 17 | 3477 |
| | Fomalhaut | W. | 42 19 16 | 3247 | 43 44 29 | 3205 | 45 10 32 | 3165 | 46 37 23 | 3129 |
| | Saturn | W. | 34 44 37 | 2634 | 36 22 46 | 2626 | 38 1 6 | 2617 | 39 39 38 | 2608 |
| | Aldebaran | E. | 59 50 46 | 2762 | 58 15 28 | 2756 | 56 40 3 | 2752 | 55 4 32 | 2747 |
| | Pollux | E. | 102 38 16 | 2661 | 101 0 44 | 2653 | 99 23 1 | 2644 | 97 45 6 | 2635 |
| | Venus | E. | 110 26 58 | 2981 | 108 56 22 | 2971 | 107 25 33 | 2962 | 105 54 32 | 2952 |
| 6 | α Aquilæ | W. | 81 19 4 | 3386 | 82 41 36 | 3372 | 84 4 24 | 3359 | 85 27 27 | 3348 |
| | Fomalhaut | W. | 54 1 35 | 2983 | 55 32 9 | 2960 | 57 3 12 | 2938 | 58 34 43 | 2916 |
| | Saturn | W. | 47 55 13 | 2566 | 49 34 55 | 2558 | 51 14 48 | 2550 | 52 54 52 | 2541 |
| | Aldebaran | E. | 47 5 50 | 2736 | 45 29 58 | 2737 | 43 54 7 | 2738 | 42 18 18 | 2741 |
| | Pollux | E. | 89 32 36 | 2593 | 87 53 32 | 2585 | 86 14 16 | 2577 | 84 34 49 | 2568 |
| | Venus | E. | 98 16 26 | 2905 | 96 44 14 | 2896 | 95 11 50 | 2887 | 93 39 15 | 2878 |
| 7 | α Aquilæ | W. | 92 25 41 | 3305 | 93 49 47 | 3300 | 95 13 59 | 3296 | 96 38 15 | 3293 |
| | Fomalhaut | W. | 66 18 33 | 2827 | 67 52 26 | 2812 | 69 26 38 | 2798 | 71 1 10 | 2783 |
| | Saturn | W. | 61 18 6 | 2500 | 62 59 19 | 2492 | 64 40 43 | 2484 | 66 22 19 | 2476 |
| | α Pegasi | W. | 44 54 57 | 3036 | 46 24 25 | 3001 | 47 54 37 | 2968 | 49 25 30 | 2937 |
| | Aldebaran | E. | 34 20 45 | 2782 | 32 45 53 | 2798 | 31 11 22 | 2818 | 29 37 18 | 2843 |
| | Pollux | E. | 76 14 41 | 2527 | 74 34 6 | 2519 | 72 53 19 | 2511 | 71 12 21 | 2502 |
| | Venus | E. | 85 53 30 | 2835 | 84 19 48 | 2827 | 82 45 55 | 2818 | 81 11 51 | 2811 |
| | Sun | E. | 130 35 53 | 2849 | 129 2 29 | 2840 | 127 28 53 | 2831 | 125 55 6 | 2822 |
| 8 | α Aquilæ | W. | 103 39 55 | 3300 | 105 4 7 | 3305 | 106 28 13 | 3313 | 107 52 10 | 3321 |
| | Fomalhaut | W. | 78 58 8 | 2722 | 80 34 18 | 2711 | 82 10 43 | 2701 | 83 47 21 | 2692 |
| | Saturn | W. | 74 53 7 | 2436 | 76 35 51 | 2428 | 78 18 46 | 2420 | 80 1 52 | 2412 |
| | α Pegasi | W. | 57 8 52 | 2811 | 58 43 5 | 2791 | 60 17 45 | 2772 | 61 52 50 | 2753 |
| | Pollux | E. | 62 44 41 | 2463 | 61 2 36 | 2455 | 59 20 19 | 2447 | 57 37 51 | 2439 |
| | Venus | E. | 73 18 54 | 2771 | 71 43 48 | 2763 | 70 8 31 | 2755 | 68 33 4 | 2747 |
| | Regulus | E. | 99 34 38 | 2460 | 97 52 29 | 2453 | 96 10 9 | 2444 | 94 27 37 | 2436 |
| | Sun | E. | 118 3 20 | 2779 | 116 28 25 | 2770 | 114 53 18 | 2762 | 113 18 0 | 2753 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Fomalhaut | W. | 85° 24′ 12″ | 2683 | 87° 1′ 15″ | 2674 | 88° 38′ 30″ | 2666 | 90° 15′ 56″ | 2657 |
| | Saturn | W. | 81 45 10 | 2404 | 83 28 39 | 2396 | 85 12 20 | 2389 | 86 56 11 | 2380 |
| | α Pegasi | W. | 63 28 20 | 2736 | 65 4 12 | 2719 | 66 40 26 | 2704 | 68 17 1 | 2689 |
| | Pollux | E. | 55 55 12 | 2431 | 54 12 22 | 2424 | 52 29 21 | 2416 | 50 46 9 | 2408 |
| | Venus | E. | 66 57 27 | 2740 | 65 21 40 | 2732 | 63 45 43 | 2725 | 62 9 37 | 2718 |
| | Regulus | E. | 92 44 54 | 2429 | 91 2 0 | 2420 | 89 18 54 | 2412 | 87 35 37 | 2404 |
| | Sun | E. | 111 42 31 | 2745 | 110 6 51 | 2736 | 108 30 59 | 2728 | 106 54 56 | 2719 |
| 10 | Fomalhaut | W. | 98 25 33 | 2626 | 100 3 53 | 2621 | 101 42 20 | 2616 | 103 20 53 | 2613 |
| | Saturn | W. | 95 38 17 | 2342 | 97 23 15 | 2334 | 99 8 25 | 2326 | 100 53 46 | 2319 |
| | α Pegasi | W. | 76 24 36 | 2625 | 78 2 57 | 2614 | 79 41 33 | 2603 | 81 20 24 | 2593 |
| | α Arietis | W. | 33 16 1 | 2445 | 34 58 32 | 2430 | 36 41 24 | 2417 | 38 24 35 | 2404 |
| | Pollux | E. | 42 7 28 | 2371 | 40 23 12 | 2364 | 38 38 45 | 2357 | 36 54 8 | 2350 |
| | Venus | E. | 54 6 47 | 2685 | 52 29 47 | 2679 | 50 52 39 | 2673 | 49 15 23 | 2668 |
| | Regulus | E. | 78 56 22 | 2365 | 77 11 57 | 2358 | 75 27 22 | 2350 | 73 42 36 | 2343 |
| | Sun | E. | 98 51 51 | 2678 | 97 14 41 | 2669 | 95 37 19 | 2660 | 93 59 46 | 2653 |
| 11 | Saturn | W. | 109 43 13 | 2283 | 111 29 38 | 2275 | 113 16 14 | 2268 | 115 3 0 | 2262 |
| | α Pegasi | W. | 89 37 46 | 2552 | 91 17 47 | 2545 | 92 57 58 | 2538 | 94 38 18 | 2533 |
| | α Arietis | W. | 47 4 42 | 2350 | 48 49 29 | 2341 | 50 34 29 | 2331 | 52 19 43 | 2322 |
| | Venus | E. | 41 7 23 | 2646 | 39 29 31 | 2644 | 37 51 36 | 2642 | 36 13 38 | 2642 |
| | Regulus | E. | 64 56 3 | 2307 | 63 10 13 | 2299 | 61 24 12 | 2292 | 59 38 1 | 2285 |
| | Sun | E. | 85 49 22 | 2613 | 84 10 45 | 2606 | 82 31 58 | 2599 | 80 53 1 | 2591 |
| 12 | α Arietis | W. | 61 8 54 | 2284 | 62 55 17 | 2277 | 64 41 51 | 2270 | 66 28 34 | 2264 |
| | Aldebaran | W. | 31 12 37 | 2532 | 32 53 6 | 2501 | 34 34 18 | 2473 | 36 16 9 | 2448 |
| | Regulus | E. | 50 44 41 | 2254 | 48 57 34 | 2248 | 47 10 18 | 2243 | 45 22 54 | 2238 |
| | Sun | E. | 72 35 49 | 2557 | 70 55 55 | 2551 | 69 15 52 | 2545 | 67 35 41 | 2538 |
| 13 | α Arietis | W. | 75 24 20 | 2238 | 77 11 51 | 2233 | 78 59 29 | 2229 | 80 47 13 | 2226 |
| | Aldebaran | W. | 44 52 56 | 2360 | 46 37 28 | 2348 | 48 22 18 | 2337 | 50 7 24 | 2327 |
| | Regulus | E. | 36 24 7 | 2215 | 34 36 2 | 2212 | 32 47 53 | 2209 | 30 59 39 | 2206 |
| | Sun | E. | 59 12 51 | 2514 | 57 31 57 | 2510 | 55 50 57 | 2506 | 54 9 52 | 2502 |
| 14 | α Arietis | W. | 89 46 59 | 2214 | 91 35 5 | 2213 | 93 23 13 | 2212 | 95 11 22 | 2212 |
| | Aldebaran | W. | 58 56 5 | 2291 | 60 42 18 | 2286 | 62 28 38 | 2283 | 64 15 3 | 2279 |
| | Sun | E. | 45 43 23 | 2491 | 44 1 57 | 2489 | 42 20 29 | 2489 | 40 39 0 | 2489 |
| 15 | α Arietis | W. | 104 11 55 | 2219 | 105 59 54 | 2222 | 107 47 49 | 2225 | 109 35 39 | 2229 |
| | Sun | E. | 32 11 43 | 2494 | 30 30 22 | 2497 | 28 49 4 | 2499 | 27 7 50 | 2504 |
| 19 | Sun | W. | 20 28 0 | 2812 | 22 2 12 | 2828 | 23 36 4 | 2844 | 25 9 35 | 2859 |
| | Antares | E. | 50 47 35 | 2486 | 49 6 2 | 2502 | 47 24 51 | 2517 | 45 44 1 | 2532 |
| 20 | Sun | W. | 32 51 56 | 2943 | 34 23 20 | 2960 | 35 54 23 | 2977 | 37 25 5 | 2993 |
| | Antares | E. | 37 25 8 | 2609 | 35 46 25 | 2624 | 34 8 3 | 2640 | 32 30 3 | 2656 |
| | α Aquilæ | E. | 91 14 48 | 3386 | 89 52 16 | 3402 | 88 30 2 | 3419 | 87 8 7 | 3436 |
| 21 | Sun | W. | 44 53 22 | 3077 | 46 22 0 | 3093 | 47 50 18 | 3110 | 49 18 16 | 3125 |
| | α Aquilæ | E. | 80 23 52 | 3541 | 79 4 13 | 3565 | 77 45 0 | 3589 | 76 26 14 | 3615 |
| 22 | Sun | W. | 56 33 25 | 3201 | 57 59 33 | 3215 | 59 25 24 | 3230 | 60 50 58 | 3243 |
| | α Aquilæ | E. | 69 59 44 | 3761 | 68 44 1 | 3794 | 67 28 53 | 3828 | 66 14 20 | 3864 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XV^h. | P. L. of Diff. | XVIII^h. | P. L. of Diff. | XXI^h. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Fomalhaut | W. | 91° 53′ 33″ | 2650 | 93° 31′ 20″ | 2643 | 95° 9′ 16″ | 2637 | 96° 47′ 21″ | 2632 |
| | Saturn | W. | 88 40 14 | 2373 | 90 24 28 | 2365 | 92 8 53 | 2357 | 93 53 29 | 2349 |
| | α Pegasi | W. | 69 53 56 | 2675 | 71 31 9 | 2661 | 73 8 41 | 2649 | 74 46 30 | 2636 |
| | Pollux | E. | 49 2 46 | 2401 | 47 19 13 | 2394 | 45 35 29 | 2386 | 43 51 34 | 2378 |
| | Venus | E. | 60 33 21 | 2711 | 58 56 56 | 2704 | 57 20 22 | 2698 | 55 43 39 | 2691 |
| | Regulus | E. | 85 52 8 | 2396 | 84 8 28 | 2389 | 82 24 37 | 2381 | 80 40 35 | 2373 |
| | Sun | E. | 105 18 41 | 2710 | 103 42 15 | 2702 | 102 5 38 | 2694 | 100 28 50 | 2686 |
| 10 | Fomalhaut | W. | 104 59 30 | 2610 | 106 38 11 | 2607 | 108 16 56 | 2606 | 109 55 43 | 2605 |
| | Saturn | W. | 102 39 18 | 2311 | 104 25 1 | 2304 | 106 10 54 | 2297 | 107 56 58 | 2289 |
| | α Pegasi | W. | 82 59 28 | 2584 | 84 38 45 | 2575 | 86 18 14 | 2566 | 87 57 55 | 2559 |
| | α Arietis | W. | 40 8 4 | 2392 | 41 51 50 | 2381 | 43 35 52 | 2370 | 45 20 10 | 2360 |
| | Pollux | E. | 35 9 22 | 2344 | 33 24 26 | 2337 | 31 39 20 | 2331 | 29 54 5 | 2325 |
| | Venus | E. | 47 38 0 | 2663 | 46 0 30 | 2658 | 44 22 54 | 2653 | 42 45 11 | 2649 |
| | Regulus | E. | 71 57 39 | 2335 | 70 12 31 | 2328 | 68 27 12 | 2321 | 66 41 43 | 2313 |
| | Sun | E. | 92 22 3 | 2645 | 90 44 9 | 2637 | 89 6 4 | 2629 | 87 27 48 | 2621 |
| 11 | Saturn | W. | 116 49 55 | 2256 | 118 37 0 | 2249 | 120 24 15 | 2243 | 122 11 39 | 2236 |
| | α Pegasi | W. | 96 18 45 | 2528 | 97 59 19 | 2524 | 99 39 59 | 2520 | 101 20 44 | 2517 |
| | α Arietis | W. | 54 5 10 | 2314 | 55 50 49 | 2306 | 57 36 40 | 2298 | 59 22 42 | 2291 |
| | Venus | E. | 34 35 40 | 2642 | 32 57 42 | 2643 | 31 19 46 | 2646 | 29 41 54 | 2652 |
| | Regulus | E. | 57 51 40 | 2279 | 56 5 9 | 2272 | 54 18 29 | 2266 | 52 31 39 | 2260 |
| | Sun | E. | 79 13 54 | 2584 | 77 34 37 | 2577 | 75 55 10 | 2570 | 74 15 34 | 2564 |
| 12 | α Arietis | W. | 68 15 27 | 2258 | 70 2 28 | 2252 | 71 49 38 | 2247 | 73 36 55 | 2242 |
| | Aldebaran | W. | 37 58 35 | 2426 | 39 41 32 | 2408 | 41 24 56 | 2390 | 43 8 45 | 2375 |
| | Regulus | E. | 43 35 23 | 2233 | 41 47 44 | 2228 | 39 59 58 | 2224 | 38 12 6 | 2219 |
| | Sun | E. | 65 55 21 | 2533 | 64 14 54 | 2528 | 62 34 20 | 2523 | 60 53 39 | 2518 |
| 13 | α Arietis | W. | 82 35 2 | 2223 | 84 22 56 | 2220 | 86 10 54 | 2218 | 87 58 55 | 2216 |
| | Aldebaran | W. | 51 52 44 | 2317 | 53 38 18 | 2309 | 55 24 4 | 2302 | 57 10 0 | 2296 |
| | Regulus | E. | 29 11 20 | 2204 | 27 22 58 | 2202 | 25 34 34 | 2201 | 23 46 8 | 2201 |
| | Sun | E. | 52 28 42 | 2499 | 50 47 27 | 2496 | 49 6 8 | 2494 | 47 24 47 | 2492 |
| 14 | α Arietis | W. | 96 59 31 | 2212 | 98 47 40 | 2214 | 100 35 47 | 2215 | 102 23 52 | 2216 |
| | Aldebaran | W. | 66 1 33 | 2277 | 67 48 7 | 2275 | 69 34 43 | 2274 | 71 21 21 | 2274 |
| | Sun | E. | 38 57 31 | 2489 | 37 16 2 | 2489 | 35 34 34 | 2490 | 33 53 7 | 2492 |
| 15 | α Arietis | W. | 111 23 23 | 2234 | 113 11 0 | 2239 | 114 58 30 | 2244 | 116 45 52 | 2250 |
| | Sun | E. | 25 26 42 | 2508 | 23 45 40 | 2512 | 22 4 44 | 2518 | 20 23 56 | 2523 |
| 19 | Sun | W. | 26 42 46 | 2876 | 28 15 35 | 2893 | 29 48 3 | 2909 | 31 20 10 | 2926 |
| | Antares | E. | 44 3 32 | 2547 | 42 23 24 | 2562 | 40 43 37 | 2578 | 39 4 12 | 2593 |
| 20 | Sun | W. | 38 55 26 | 3010 | 40 25 26 | 3027 | 41 55 5 | 3043 | 43 24 24 | 3060 |
| | Antares | E. | 30 52 24 | 2672 | 29 15 6 | 2687 | 27 38 9 | 2703 | 26 1 33 | 2718 |
| | α Aquilæ | E. | 85 46 31 | 3455 | 84 25 17 | 3475 | 83 4 25 | 3496 | 81 43 56 | 3518 |
| 21 | Sun | W. | 50 45 55 | 3141 | 52 13 15 | 3157 | 53 40 16 | 3172 | 55 6 59 | 3186 |
| | α Aquilæ | E. | 75 7 56 | 3642 | 73 50 7 | 3670 | 72 32 48 | 3699 | 71 16 0 | 3729 |
| 22 | Sun | W. | 62 16 16 | 3257 | 63 41 18 | 3270 | 65 6 5 | 3282 | 66 30 37 | 3294 |
| | α Aquilæ | E. | 65 0 24 | 3902 | 63 47 6 | 3940 | 62 34 27 | 3981 | 61 22 29 | 4025 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | Fomalhaut | E. | 93° 44′ 55″ | 3102 | 92° 16′ 48″ | 3114 | 90° 48′ 56″ | 3128 | 89° 21′ 20″ | 3140 |
| | Saturn | E. | 96 27 34 | 2825 | 94 53 38 | 2838 | 93 20 0 | 2851 | 91 46 38 | 2863 |
| 23 | Sun | W. | 67 54 55 | 3306 | 69 18 59 | 3318 | 70 42 50 | 3329 | 72 6 28 | 3340 |
| | α Aquilæ | E. | 60 11 14 | 4070 | 59 0 43 | 4117 | 57 50 58 | 4167 | 56 42 1 | 4219 |
| | Fomalhaut | E. | 82 7 10 | 3204 | 80 41 6 | 3217 | 79 15 17 | 3230 | 77 49 43 | 3242 |
| | Saturn | E. | 84 3 42 | 2921 | 82 31 50 | 2932 | 81 0 12 | 2942 | 79 28 46 | 2953 |
| | α Pegasi | E. | 104 7 43 | 3205 | 102 41 40 | 3213 | 101 15 46 | 3220 | 99 50 1 | 3227 |
| 24 | Sun | W. | 79 1 44 | 3386 | 80 24 17 | 3393 | 81 46 41 | 3400 | 83 8 57 | 3407 |
| | Jupiter | W. | 23 12 39 | 3202 | 24 38 46 | 3197 | 26 4 59 | 3193 | 27 31 17 | 3189 |
| | α Aquilæ | E. | 51 10 30 | 4535 | 50 7 9 | 4612 | 49 4 55 | 4695 | 48 3 51 | 4782 |
| | Fomalhaut | E. | 70 45 38 | 3306 | 69 21 34 | 3319 | 67 57 45 | 3332 | 66 34 10 | 3345 |
| | Saturn | E. | 71 54 30 | 2994 | 70 24 10 | 3001 | 68 53 58 | 3007 | 67 23 54 | 3014 |
| | α Pegasi | E. | 92 43 22 | 3263 | 91 18 27 | 3270 | 89 53 40 | 3276 | 88 29 1 | 3283 |
| 25 | Sun | W. | 89 58 35 | 3433 | 91 20 14 | 3437 | 92 41 49 | 3439 | 94 3 21 | 3442 |
| | Jupiter | W. | 34 43 32 | 3182 | 36 10 3 | 3181 | 37 36 35 | 3180 | 39 3 8 | 3179 |
| | Antares | W. | 24 35 33 | 3060 | 26 4 31 | 3063 | 27 33 26 | 3065 | 29 2 18 | 3068 |
| | α Aquilæ | E. | 43 18 16 | 5341 | 42 25 39 | 5484 | 41 34 44 | 5642 | 40 45 38 | 5813 |
| | Saturn | E. | 59 55 18 | 3037 | 58 25 51 | 3040 | 56 56 28 | 3043 | 55 27 9 | 3045 |
| | Fomalhaut | E. | 59 40 7 | 3414 | 58 18 6 | 3428 | 56 56 21 | 3443 | 55 34 53 | 3460 |
| | α Pegasi | E. | 81 27 35 | 8313 | 80 3 38 | 3318 | 78 39 47 | 3324 | 77 16 3 | 3329 |
| 26 | Sun | W. | 100 50 29 | 3446 | 102 11 53 | 3446 | 103 33 17 | 3445 | 104 54 43 | 3444 |
| | Jupiter | W. | 46 16 12 | 3172 | 47 42 55 | 3170 | 49 9 40 | 3167 | 50 36 29 | 3164 |
| | Antares | W. | 36 26 8 | 3071 | 37 54 53 | 3071 | 39 23 38 | 3069 | 40 52 25 | 3069 |
| | Saturn | E. | 48 1 2 | 3049 | 46 31 50 | 3049 | 45 2 38 | 3047 | 43 33 24 | 3047 |
| | Fomalhaut | E. | 48 52 25 | 3554 | 47 33 0 | 3576 | 46 13 59 | 3600 | 44 55 25 | 3627 |
| | α Pegasi | E. | 70 18 53 | 3354 | 68 55 44 | 3359 | 67 32 41 | 3365 | 66 9 44 | 3370 |
| | α Arietis | E. | 111 49 8 | 3100 | 110 20 58 | 3099 | 108 52 47 | 3096 | 107 24 33 | 3095 |
| 27 | Sun | W. | 111 42 30 | 3428 | 113 4 15 | 3423 | 114 26 5 | 3417 | 115 48 2 | 3412 |
| | Jupiter | W. | 57 51 35 | 3143 | 59 18 52 | 3138 | 60 46 15 | 3133 | 62 13 44 | 3127 |
| | Antares | W. | 48 17 0 | 3053 | 49 46 7 | 3048 | 51 15 20 | 3043 | 52 44 39 | 3039 |
| | Saturn | E. | 36 6 36 | 3031 | 34 37 2 | 3027 | 33 7 23 | 3023 | 31 37 39 | 3018 |
| | α Pegasi | E. | 59 16 34 | 3399 | 57 54 16 | 3407 | 56 32 7 | 3415 | 55 10 7 | 3423 |
| | α Arietis | E. | 100 2 37 | 3078 | 98 34 1 | 3073 | 97 5 19 | 3069 | 95 36 31 | 3063 |
| 28 | Sun | W. | 122 39 29 | 3379 | 124 2 10 | 3370 | 125 25 1 | 3362 | 126 48 1 | 3353 |
| | Jupiter | W. | 69 33 8 | 3092 | 71 1 27 | 3084 | 72 29 56 | 3076 | 73 58 35 | 3068 |
| | Antares | W. | 60 12 58 | 3006 | 61 43 3 | 2999 | 63 13 17 | 2991 | 64 43 41 | 2983 |
| | α Arietis | E. | 88 10 44 | 3031 | 86 41 10 | 3024 | 85 11 27 | 3016 | 83 41 34 | 3009 |
| 29 | Jupiter | W. | 81 24 33 | 3021 | 82 54 20 | 3010 | 84 24 20 | 3000 | 85 54 33 | 2990 |
| | Antares | W. | 72 18 22 | 2938 | 73 49 53 | 2927 | 75 21 37 | 2917 | 76 53 34 | 2907 |
| | α Arietis | E. | 76 9 35 | 2964 | 74 38 37 | 2954 | 73 7 27 | 2945 | 71 36 5 | 2935 |
| | Aldebaran | E. | 107 13 27 | 3019 | 105 43 38 | 3008 | 104 13 35 | 2997 | 102 43 18 | 2985 |
| 30 | Jupiter | W. | 93 28 58 | 2934 | 95 0 34 | 2923 | 96 32 24 | 2911 | 98 4 29 | 2899 |
| | Antares | W. | 84 36 43 | 2852 | 86 10 4 | 2841 | 87 43 39 | 2828 | 89 17 30 | 2817 |
| | α Arietis | E. | 63 56 2 | 2883 | 62 23 22 | 2873 | 60 50 28 | 2862 | 59 17 20 | 2852 |
| | Aldebaran | E. | 95 8 17 | 2927 | 93 36 32 | 2916 | 92 4 33 | 2904 | 90 32 19 | 2892 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | Fomalhaut | E. | 87° 53′ 59″ | 3153 | 86° 26′ 54″ | 3166 | 85° 0′ 4″ | 3178 | 83° 33′ 29″ | 3192 |
| | Saturn | E. | 90 13 32 | 2876 | 88 40 42 | 2887 | 87 8 7 | 2899 | 85 35 47 | 2911 |
| 23 | Sun | W. | 73 29 53 | 3350 | 74 53 7 | 3359 | 76 16 10 | 3369 | 77 39 2 | 3378 |
| | α Aquilæ | E. | 55 33 53 | 4276 | 54 26 38 | 4335 | 53 20 18 | 4397 | 52 14 54 | 4464 |
| | Fomalhaut | E. | 76 24 24 | 3255 | 74 59 20 | 3268 | 73 34 31 | 3281 | 72 9 57 | 3294 |
| | Saturn | E. | 77 57 33 | 2961 | 76 26 31 | 2969 | 74 55 40 | 2978 | 73 25 0 | 2986 |
| | α Pegasi | E. | 98 24 24 | 3235 | 96 58 56 | 3242 | 95 33 36 | 3249 | 94 8 25 | 3256 |
| 24 | Sun | W. | 84 31 6 | 3414 | 85 53 7 | 3419 | 87 15 2 | 3424 | 88 36 51 | 3429 |
| | Jupiter | W. | 28 57 39 | 3186 | 30 24 5 | 3184 | 31 50 33 | 3183 | 33 17 2 | 3183 |
| | α Aquilæ | E. | 47 4 0 | 4877 | 46 5 27 | 4979 | 45 8 15 | 5090 | 44 12 30 | 5210 |
| | Fomalhaut | E. | 65 10 51 | 3358 | 63 47 47 | 3372 | 62 24 58 | 3386 | 61 2 25 | 3399 |
| | Saturn | E. | 65 53 58 | 3019 | 64 24 9 | 3024 | 62 54 26 | 3029 | 61 24 49 | 3034 |
| | α Pegasi | E. | 87 4 30 | 3289 | 85 40 6 | 3295 | 84 15 49 | 3301 | 82 51 39 | 3306 |
| 25 | Sun | W. | 95 24 50 | 3444 | 96 46 17 | 3446 | 98 7 42 | 3446 | 99 29 6 | 3447 |
| | Jupiter | W. | 40 29 42 | 3178 | 41 56 17 | 3177 | 43 22 54 | 3176 | 44 49 32 | 3174 |
| | Antares | W. | 30 31 7 | 3069 | 31 59 54 | 3070 | 33 28 40 | 3072 | 34 57 24 | 3072 |
| | α Aquilæ | E. | 39 58 26 | 6003 | 39 13 15 | 6213 | 38 30 12 | 6444 | 37 49 23 | 6704 |
| | Saturn | E. | 53 57 52 | 3047 | 52 28 38 | 3048 | 50 59 25 | 3049 | 49 30 13 | 3050 |
| | Fomalhaut | E. | 54 13 44 | 3477 | 52 52 54 | 3494 | 51 32 23 | 3513 | 50 12 13 | 3533 |
| | α Pegasi | E. | 75 52 25 | 3334 | 74 28 53 | 3339 | 73 5 27 | 3345 | 71 42 7 | 3350 |
| 26 | Sun | W. | 106 16 10 | 3441 | 107 37 40 | 3438 | 108 59 13 | 3436 | 110 20 49 | 3431 |
| | Jupiter | W. | 52 3 21 | 3161 | 53 30 17 | 3157 | 54 57 18 | 3153 | 56 24 24 | 3148 |
| | Antares | W. | 42 21 13 | 3066 | 43 50 4 | 3063 | 45 18 59 | 3060 | 46 47 57 | 3056 |
| | Saturn | E. | 42 4 9 | 3044 | 40 34 51 | 3042 | 39 5 30 | 3039 | 37 36 5 | 3035 |
| | Fomalhaut | E. | 43 37 20 | 3656 | 42 19 46 | 3689 | 41 2 47 | 3724 | 39 46 25 | 3764 |
| | α Pegasi | E. | 64 46 53 | 3375 | 63 24 8 | 3381 | 62 1 30 | 3387 | 60 38 59 | 3393 |
| | α Arietis | E. | 105 56 17 | 3092 | 104 27 58 | 3089 | 102 59 35 | 3086 | 101 31 8 | 3082 |
| 27 | Sun | W. | 117 10 5 | 3407 | 118 32 14 | 3400 | 119 54 31 | 3393 | 121 16 56 | 3386 |
| | Jupiter | W. | 63 41 21 | 3120 | 65 9 6 | 3114 | 66 36 59 | 3108 | 68 4 59 | 3101 |
| | Antares | W. | 54 14 4 | 3033 | 55 43 36 | 3027 | 57 13 15 | 3021 | 58 43 2 | 3014 |
| | Saturn | E. | 30 7 48 | 3013 | 28 37 51 | 3006 | 27 7 46 | 3000 | 25 37 33 | 2993 |
| | α Pegasi | E. | 53 48 16 | 3432 | 52 26 36 | 3442 | 51 5 7 | 3454 | 49 43 52 | 3467 |
| | α Arietis | E. | 94 7 36 | 3058 | 92 38 35 | 3052 | 91 9 26 | 3045 | 89 40 9 | 3039 |
| 28 | Sun | W. | 128 11 11 | 3344 | 129 34 32 | 3335 | 130 58 3 | 3325 | 132 21 46 | 3315 |
| | Jupiter | W. | 75 27 24 | 3059 | 76 56 24 | 3050 | 78 25 35 | 3040 | 79 54 58 | 3030 |
| | Antares | W. | 66 14 15 | 2974 | 67 45 0 | 2965 | 69 15 56 | 2957 | 70 47 3 | 2947 |
| | α Arietis | E. | 82 11 32 | 3000 | 80 41 19 | 2991 | 79 10 55 | 2983 | 77 40 21 | 2973 |
| 29 | Jupiter | W. | 87 24 58 | 2979 | 88 55 37 | 2968 | 90 26 30 | 2957 | 91 57 37 | 2946 |
| | Antares | W. | 78 25 44 | 2896 | 79 58 8 | 2885 | 81 30 46 | 2875 | 83 3 37 | 2863 |
| | α Arietis | E. | 70 4 30 | 2924 | 68 32 42 | 2915 | 67 0 42 | 2905 | 65 28 29 | 2894 |
| | Aldebaran | E. | 101 12 47 | 2973 | 99 42 1 | 2962 | 98 11 1 | 2950 | 96 39 46 | 2939 |
| 30 | Jupiter | W. | 99 36 49 | 2887 | 101 9 24 | 2876 | 102 42 14 | 2864 | 104 15 19 | 2852 |
| | Antares | W. | 90 51 36 | 2805 | 92 25 57 | 2793 | 94 0 34 | 2781 | 95 35 27 | 2769 |
| | α Arietis | E. | 57 43 59 | 2841 | 56 10 24 | 2830 | 54 36 35 | 2820 | 53 2 33 | 2809 |
| | Aldebaran | E. | 88 59 50 | 2880 | 87 27 6 | 2868 | 85 54 6 | 2856 | 84 20 51 | 2845 |

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S |  |  |  |  | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be subtracted from Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
|  |  | *Apparent* Right Ascension. | Diff. for 1 hour. | *Apparent* Declination. | Diff. for 1 hour. | Semi-diameter. |  |  |  |
|  |  | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| *Sun.* | 1 | 12 31 42.17 | 9.062 | S. 3 25 27.1 | –58.20 | 16 1.69 | 64.39 | 10 30.53 | 0.793 |
| Mon. | 2 | 12 35 19.80 | 9.076 | 3 48 42.8 | 58.10 | 16 1.97 | 64.44 | 10 49.40 | 0.780 |
| Tues. | 3 | 12 38 57.74 | 9.087 | 4 11 55.8 | 57.99 | 16 2.25 | 64.49 | 11 7.98 | 0.767 |
| Wed. | 4 | 12 42 36.02 | 9.102 | 4 35 6.0 | 57.86 | 16 2.53 | 64.54 | 11 26.19 | 0.751 |
| Thur. | 5 | 12 46 14.67 | 9.118 | 4 58 12.8 | 57.71 | 16 2.81 | 64.59 | 11 44.04 | 0.735 |
| Frid. | 6 | 12 49 53.71 | 9.135 | 5 21 15.9 | 57.55 | 16 3.09 | 64.65 | 12 1.50 | 0.718 |
| Sat. | 7 | 12 53 33.17 | 9.153 | 5 44 15.1 | 57.38 | 16 3.36 | 64.71 | 12 18.54 | 0.700 |
| *Sun.* | 8 | 12 57 13.08 | 9.172 | 6 7 10.1 | 57.19 | 16 3.64 | 64.77 | 12 35.15 | 0.682 |
| Mon. | 9 | 13 0 53.45 | 9.192 | 6 30 0.3 | 56.99 | 16 3.91 | 64.84 | 12 51.30 | 0.663 |
| Tues. | 10 | 13 4 34.29 | 9.213 | 6 52 45.5 | 56.77 | 16 4.18 | 64.91 | 13 6.97 | 0.643 |
| Wed. | 11 | 13 8 15.62 | 9.234 | 7 15 25.3 | 56.53 | 16 4.45 | 64.98 | 13 22.16 | 0.622 |
| Thur. | 12 | 13 11 57.47 | 9.256 | 7 37 59.2 | 56.28 | 16 4.72 | 65.06 | 13 36.83 | 0.599 |
| Frid. | 13 | 13 15 39.86 | 9.278 | 8 0 27.0 | 56.02 | 16 4.99 | 65.14 | 13 50.96 | 0.576 |
| Sat. | 14 | 13 19 22.80 | 9.301 | 8 22 48.1 | 55.74 | 16 5.26 | 65.22 | 14 4.53 | 0.553 |
| *Sun.* | 15 | 13 23 6.30 | 9.324 | 8 45 2.3 | 55.44 | 16 5.53 | 65.30 | 14 17.54 | 0.530 |
| Mon. | 16 | 13 26 50.38 | 9.349 | 9 7 9.3 | 55.12 | 16 5.80 | 65.38 | 14 29.98 | 0.505 |
| Tues. | 17 | 13 30 35.06 | 9.374 | 9 29 8.3 | 54.78 | 16 6.07 | 65.47 | 14 41.81 | 0.480 |
| Wed. | 18 | 13 34 20.36 | 9.400 | 9 50 59.1 | 54.44 | 16 6.34 | 65.56 | 14 53.03 | 0.454 |
| Thur. | 19 | 13 38 6.29 | 9.426 | 10 12 41.2 | 54.07 | 16 6.61 | 65.65 | 15 3.63 | 0.428 |
| Frid. | 20 | 13 41 52.84 | 9.453 | 10 34 14.3 | 53.68 | 16 6.88 | 65.74 | 15 13.60 | 0.401 |
| Sat. | 21 | 13 45 40.04 | 9.480 | 10 55 37.8 | 53.28 | 16 7.15 | 65.84 | 15 22.93 | 0.374 |
| *Sun.* | 22 | 13 49 27.91 | 9.507 | 11 16 51.5 | 52.86 | 16 7.42 | 65.94 | 15 31.60 | 0.346 |
| Mon. | 23 | 13 53 16.44 | 9.536 | 11 37 54.9 | 52.42 | 16 7.69 | 66.04 | 15 39.60 | 0.318 |
| Tues. | 24 | 13 57 5.66 | 9.565 | 11 58 47.6 | 51.96 | 16 7.96 | 66.14 | 15 46.92 | 0.289 |
| Wed. | 25 | 14 0 55.58 | 9.595 | 12 19 29.1 | 51.49 | 16 8.23 | 66.25 | 15 53.54 | 0.260 |
| Thur. | 26 | 14 4 46.21 | 9.625 | 12 39 59.2 | 51.00 | 16 8.50 | 66.35 | 15 59.45 | 0.230 |
| Frid. | 27 | 14 8 37.55 | 9.655 | 13 0 17.2 | 50.50 | 16 8.76 | 66.46 | 16 4.64 | 0.200 |
| Sat. | 28 | 14 12 29.64 | 9.686 | 13 20 23.1 | 49.98 | 16 9.03 | 66.57 | 16 9.09 | 0.169 |
| *Sun.* | 29 | 14 16 22.49 | 9.717 | 13 40 16.4 | 49.45 | 16 9.29 | 66.68 | 16 12.80 | 0.138 |
| Mon. | 30 | 14 20 16.10 | 9.749 | 13 59 56.7 | 48.90 | 16 9.55 | 66.79 | 16 15.74 | 0.106 |
| Tues. | 31 | 14 24 10.49 | 9.782 | 14 19 23.4 | 48.33 | 16 9.81 | 66.91 | 16 17.90 | 0.073 |
| Wed. | 32 | 14 28 5.68 | 9.815 | S. 14 38 36.3 | –47.74 | 16 10.06 | 67.02 | 16 19.26 | 0.040 |

**Note.**—Mean Time of the Semidiameter passing may be found by subtracting $0^s.18$ from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that south declinations are increasing.

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Equation of Time, *to be added to Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| *Sun.* | 1 | 12 31 43.76 | 9.064 | S. 3 25 37.3 | -58.21 | 10 30.67 | 0.793 | 12 42 14.43 |
| Mon. | 2 | 12 35 21.44 | 9.076 | 3 48 53.2 | 58.11 | 10 49.54 | 0.780 | 12 46 10.98 |
| Tues. | 3 | 12 38 59.42 | 9.089 | 4 12 6.6 | 58.00 | 11 8.12 | 0.767 | 12 50 7.54 |
| Wed. | 4 | 12 42 37.75 | 9.104 | 4 35 17.1 | 57.87 | 11 26.34 | 0.751 | 12 54 4.09 |
| Thur. | 5 | 12 46 16.45 | 9.120 | 4 58 24.0 | 57.72 | 11 44.19 | 0.735 | 12 58 0.64 |
| Frid. | 6 | 12 49 55.54 | 9.137 | 5 21 27.5 | 57.56 | 12 1.65 | 0.718 | 13 1 57.19 |
| Sat. | 7 | 12 53 35.07 | 9.155 | 5 44 26.9 | 57.39 | 12 18.68 | 0.700 | 13 5 53.75 |
| *Sun.* | 8 | 12 57 15.01 | 9.174 | 6 7 22.1 | 57.20 | 12 35.29 | 0.682 | 13 9 50.30 |
| Mon. | 9 | 13 0 55.42 | 9.195 | 6 30 12.4 | 57.00 | 12 51.44 | 0.663 | 13 13 46.86 |
| Tues. | 10 | 13 4 36.30 | 9.215 | 6 52 57.9 | 56.78 | 13 7.11 | 0.643 | 13 17 43.41 |
| Wed. | 11 | 13 8 17.67 | 9.236 | 7 15 37.8 | 56.54 | 13 22.30 | 0.622 | 13 21 39.97 |
| Thur. | 12 | 13 11 59.56 | 9.258 | 7 38 11.9 | 56.29 | 13 36.96 | 0.599 | 13 25 36.52 |
| Frid. | 13 | 13 15 41.99 | 9.280 | 8 0 39.9 | 56.03 | 13 51.09 | 0.576 | 13 29 33.08 |
| Sat. | 14 | 13 19 24.98 | 9.303 | 8 23 1.2 | 55.75 | 14 4.65 | 0.553 | 13 33 29.63 |
| *Sun.* | 15 | 13 23 8.52 | 9.326 | 8 45 15.5 | 55.45 | 14 17.67 | 0.530 | 13 37 26.19 |
| Mon. | 16 | 13 26 52.64 | 9.351 | 9 7 22.6 | 55.13 | 14 30.10 | 0.505 | 13 41 22.74 |
| Tues. | 17 | 13 30 37.36 | 9.376 | 9 29 21.7 | 54.79 | 14 41.93 | 0.480 | 13 45 19.29 |
| Wed. | 18 | 13 34 22.69 | 9.402 | 9 51 12.6 | 54.44 | 14 53.15 | 0.454 | 13 49 15.84 |
| Thur. | 19 | 13 38 8.65 | 9.428 | 10 12 54.7 | 54.07 | 15 3.75 | 0.428 | 13 53 12.40 |
| Frid. | 20 | 13 41 55.24 | 9.455 | 10 34 27.9 | 53.68 | 15 13.71 | 0.401 | 13 57 8.95 |
| Sat. | 21 | 13 45 42.47 | 9.482 | 10 55 51.5 | 53.28 | 15 23.04 | 0.374 | 14 1 5.51 |
| *Sun.* | 22 | 13 49 30.37 | 9.509 | 11 17 5.2 | 52.86 | 15 31.69 | 0.346 | 14 5 2.06 |
| Mon. | 23 | 13 53 18.93 | 9.537 | 11 38 8.6 | 52.42 | 15 39.69 | 0.318 | 14 8 58.62 |
| Tues. | 24 | 13 57 8.17 | 9.566 | 11 59 1.2 | 51.96 | 15 47.00 | 0.289 | 14 12 55.17 |
| Wed. | 25 | 14 0 58.12 | 9.596 | 12 19 42.7 | 51.49 | 15 53.61 | 0.260 | 14 16 51.73 |
| Thur. | 26 | 14 4 48.78 | 9.626 | 12 40 12.8 | 51.00 | 15 59.50 | 0.230 | 14 20 48.28 |
| Frid. | 27 | 14 8 40.14 | 9.656 | 13 0 30.7 | 50.50 | 16 4.70 | 0.200 | 14 24 44.84 |
| Sat. | 28 | 14 12 32.25 | 9.687 | 13 20 36.5 | 49.98 | 16 9.14 | 0.169 | 14 28 41.39 |
| *Sun.* | 29 | 14 16 25.12 | 9.718 | 13 40 29.8 | 49.45 | 16 12.83 | 0.138 | 14 32 37.95 |
| Mon. | 30 | 14 20 18.74 | 9.750 | 14 0 10.0 | 48.90 | 16 15.77 | 0.106 | 14 36 34.51 |
| Tues. | 31 | 14 24 13.15 | 9.783 | 14 19 36.5 | 48.33 | 16 17.92 | 0.073 | 14 40 31.07 |
| Wed. | 32 | 14 28 8.35 | 9.816 | S. 14 38 49.3 | -47.74 | 16 19.27 | 0.040 | 14 44 27.62 |

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing.

Diff. for 1 hour. $+9^s.8565$

AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S *True* LONGITUDE. λ | THE SUN'S *True* LONGITUDE. λ′ | Diff. for 1 hour. | LATITUDE. | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 275 | 188 38 31.9 | 37 51.2 | 147.67 | −0.02 | 0.0001381 | -52.7 | 11 15 54.54 |
| 2 | 276 | 189 37 36.9 | 36 56.1 | 147.75 | +0.11 | 0.0000119 | 52.5 | 11 11 58.62 |
| 3 | 277 | 190 36 43.9 | 36 3.0 | 147.84 | 0.24 | 9.9998862 | 52.3 | 11 8 2.71 |
| 4 | 278 | 191 35 53.2 | 35 12.2 | 147.93 | 0.34 | .9997612 | 52.0 | 11 4 6.80 |
| 5 | 279 | 192 35 4.5 | 34 23.4 | 148.02 | 0.43 | .9996366 | 51.8 | 11 0 10.89 |
| 6 | 280 | 193 34 17.9 | 33 36.7 | 148.11 | 0.48 | .9995126 | 51.6 | 10 56 14.99 |
| 7 | 281 | 194 33 33.6 | 32 52.3 | 148.20 | 0.52 | .9993891 | 51.4 | 10 52 19.08 |
| 8 | 282 | 195 32 51.7 | 32 10.3 | 148.29 | 0.52 | .9992660 | 51.2 | 10 48 23.17 |
| 9 | 283 | 196 32 12.0 | 31 30.5 | 148.39 | 0.49 | .9991433 | 51.0 | 10 44 27.27 |
| 10 | 284 | 197 31 34.6 | 30 53.0 | 148.49 | 0.43 | .9990211 | 50.9 | 10 40 31.36 |
| 11 | 285 | 198 30 59.6 | 30 17.9 | 148.59 | 0.35 | .9988992 | 50.8 | 10 36 35.45 |
| 12 | 286 | 199 30 26.9 | 29 45.0 | 148.68 | 0.25 | .9987773 | 50.8 | 10 32 39.54 |
| 13 | 287 | 200 29 56.5 | 29 14.5 | 148.77 | +0.13 | .9986554 | 50.8 | 10 28 43.63 |
| 14 | 288 | 201 29 28.4 | 28 46.3 | 148.87 | 0.00 | .9985334 | 50.8 | 10 24 47.73 |
| 15 | 289 | 202 29 2.5 | 28 20.3 | 148.97 | −0.13 | .9984114 | 50.9 | 10 20 51.82 |
| 16 | 290 | 203 28 38.8 | 27 56.5 | 149.06 | 0.26 | .9982893 | 50.9 | 10 16 55.92 |
| 17 | 291 | 204 28 17.3 | 27 34.8 | 149.15 | 0.39 | .9981672 | 50.9 | 10 13 0.01 |
| 18 | 292 | 205 27 57.9 | 27 15.3 | 149.23 | 0.50 | .9980449 | 50.9 | 10 9 4.10 |
| 19 | 293 | 206 27 40.4 | 26 57.7 | 149.31 | 0.57 | .9979225 | 51.0 | 10 5 8.19 |
| 20 | 294 | 207 27 24.7 | 26 41.9 | 149.39 | 0.62 | .9978001 | 51.0 | 10 1 12.28 |
| 21 | 295 | 208 27 10.9 | 26 28.0 | 149.46 | 0.64 | .9976778 | 50.9 | 9 57 16.37 |
| 22 | 296 | 209 26 58.9 | 26 15.8 | 149.54 | 0.63 | .9975556 | 50.8 | 9 53 20.46 |
| 23 | 297 | 210 26 48.7 | 26 5.5 | 149.61 | 0.60 | .9974336 | 50.7 | 9 49 24.55 |
| 24 | 298 | 211 26 40.2 | 25 56.9 | 149.68 | 0.52 | .9973124 | 50.4 | 9 45 28.64 |
| 25 | 299 | 212 26 33.3 | 25 49.9 | 149.75 | 0.44 | .9971917 | 50.1 | 9 41 32.73 |
| 26 | 300 | 213 26 28.2 | 25 44.6 | 149.82 | 0.32 | .9970719 | 49.7 | 9 37 36.82 |
| 27 | 301 | 214 26 24.7 | 25 40.9 | 149.89 | 0.20 | .9969531 | 49.3 | 9 33 40.91 |
| 28 | 302 | 215 26 22.9 | 25 39.0 | 149.96 | −0.08 | .9968354 | 48.8 | 9 29 45.00 |
| 29 | 303 | 216 26 22.8 | 25 38.8 | 150.03 | +0.05 | .9967188 | 48.3 | 9 25 49.09 |
| 30 | 304 | 217 26 24.4 | 25 40.3 | 150.11 | 0.18 | .9966036 | 47.7 | 9 21 53.18 |
| 31 | 305 | 218 26 27.6 | 25 43.3 | 150.19 | 0.31 | .9964899 | 47.0 | 9 17 57.27 |
| 32 | 306 | 219 26 32.6 | 25 48.1 | 150.26 | +0.40 | 9.9963778 | -46.3 | 9 14 1.36 |

**Note**: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
−9s.8296

## GREENWICH MEAN TIME.

### THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | MERIDIAN PASSAGE. | | AGE. |
|---|---|---|---|---|---|---|---|---|---|
| | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. | | Diff. for 1 hour. | Noon. |
| | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 15 16.5 | 15 21.3 | 55 56.8 | +1.45 | 56 14.5 | +1.49 | 10 42.6 | 1.77 | 13.6 |
| 2 | 15 26.2 | 15 31.1 | 56 32.4 | 1.50 | 56 50.4 | 1.49 | 11 25.5 | 1.81 | 14.6 |
| 3 | 15 35.9 | 15 40.5 | 57 8.0 | 1.45 | 57 25.0 | 1.37 | 12 10.0 | 1.91 | 15.6 |
| 4 | 15 44.8 | 15 48.9 | 57 40.9 | 1.29 | 57 55.9 | 1.21 | 12 57.4 | 2.05 | 16.6 |
| 5 | 15 52.7 | 15 56.1 | 58 9.8 | 1.10 | 58 22.3 | 0.99 | 13 48.8 | 2.23 | 17.6 |
| 6 | 15 59.1 | 16 1.8 | 58 33.5 | 0.88 | 58 43.3 | 0.76 | 14 44.6 | 2.43 | 18.6 |
| 7 | 16 4.1 | 16 6.0 | 58 51.7 | 0.65 | 58 58.8 | 0.53 | 15 44.7 | 2.58 | 19.6 |
| 8 | 16 7.6 | 16 8.8 | 59 4.5 | 0.43 | 59 9.0 | 0.33 | 16 47.4 | 2.63 | 20.6 |
| 9 | 16 9.7 | 16 10.3 | 59 12.3 | 0.23 | 59 14.4 | +0.13 | 17 49.9 | 2.56 | 21.6 |
| 10 | 16 10.5 | 16 10.5 | 59 15.3 | +0.03 | 59 15.1 | −0.07 | 18 49.8 | 2.42 | 22.6 |
| 11 | 16 10.1 | 16 9.3 | 59 13.6 | −0.17 | 59 11.0 | 0.27 | 19 45.7 | 2.24 | 23.6 |
| 12 | 16 8.3 | 16 6.9 | 59 7.2 | 0.37 | 59 2.0 | 0.50 | 20 37.5 | 2.08 | 24.6 |
| 13 | 16 5.1 | 16 2.9 | 58 55.3 | 0.62 | 58 47.1 | 0.74 | 21 26.0 | 1.98 | 25.6 |
| 14 | 16 0.2 | 15 57.2 | 58 37.5 | 0.86 | 58 26.4 | 0.99 | 22 12.5 | 1.91 | 26.6 |
| 15 | 15 53.8 | 15 49.9 | 58 13.8 | 1.11 | 57 59.8 | 1.22 | 22 58.2 | 1.90 | 27.6 |
| 16 | 15 45.8 | 15 41.3 | 57 44.5 | 1.33 | 57 28.0 | 1.41 | 23 44.2 | 1.94 | 28.6 |
| 17 | 15 36.6 | 15 31.7 | 57 10.7 | 1.47 | 56 52.7 | 1.52 | ό | | 0.1 |
| 18 | 15 26.7 | 15 21.7 | 56 34.4 | 1.53 | 56 16.0 | 1.53 | 0 31.6 | 2.01 | 1.1 |
| 19 | 15 16.7 | 15 12.0 | 55 57.8 | 1.50 | 55 40.2 | 1.43 | 1 20.8 | 2.09 | 2.1 |
| 20 | 15 7.4 | 15 3.2 | 55 23.5 | 1.35 | 55 8.0 | 1.24 | 2 11.9 | 2.17 | 3.1 |
| 21 | 14 59.4 | 14 56.0 | 54 53.9 | 1.10 | 54 41.6 | 0.94 | 3 4.3 | 2.20 | 4.1 |
| 22 | 14 53.2 | 14 51.0 | 54 31.3 | 0.77 | 54 23.2 | 0.59 | 3 57.0 | 2.18 | 5.1 |
| 23 | 14 49.4 | 14 48.5 | 54 17.3 | −0.39 | 54 13.9 | −0.18 | 4 48.6 | 2.11 | 6.1 |
| 24 | 14 48.3 | 14 48.7 | 54 13.1 | +0.04 | 54 14.9 | +0.26 | 5 38.2 | 2.02 | 7.1 |
| 25 | 14 49.9 | 14 51.9 | 54 19.3 | 0.48 | 54 26.4 | 0.70 | 6 25.4 | 1.91 | 8.1 |
| 26 | 14 54.5 | 14 57.8 | 54 36.1 | 0.91 | 54 48.2 | 1.11 | 7 10.2 | 1.82 | 9.1 |
| 27 | 15 1.7 | 15 6.3 | 55 2.6 | 1.29 | 55 19.2 | 1.46 | 7 53.2 | 1.77 | 10.1 |
| 28 | 15 11.2 | 15 16.7 | 55 37.6 | 1.61 | 55 57.7 | 1.73 | 8 35.4 | 1.75 | 11.1 |
| 29 | 15 22.5 | 15 28.6 | 56 19.0 | 1.82 | 56 41.3 | 1.88 | 9 17.8 | 1.79 | 12.1 |
| 30 | 15 34.8 | 15 40.9 | 57 4.0 | 1.90 | 56 26.7 | 1.89 | 10 1.6 | 1.87 | 13.1 |
| 31 | 15 47.0 | 15 52.9 | 57 49.1 | 1.84 | 58 10.6 | 1.75 | 10 48.1 | 2.02 | 14.1 |
| 32 | 15 58.4 | 16 3.4 | 58 30.9 | +1.62 | 58 49.3 | +1.45 | 11 38.6 | 2.21 | 15.1 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | SUNDAY 1. | | | | | TUESDAY 3. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 23 6 26.27 | 1.8800 | S. 6 12 3.6 | 14.919 | 0 | 0 37 59.25 | 1.9634 | N. 6 9 58.9 | 15.578 |
| 1 | 23 8 19.07 | 1.8801 | 5 57 7.3 | 14.958 | 1 | 0 39 57.16 | 1.9670 | 6 25 33.2 | 15.564 |
| 2 | 23 10 11.88 | 1.8802 | 5 42 8.6 | 14.996 | 2 | 0 41 55.29 | 1.9707 | 6 41 6.6 | 15.547 |
| 3 | 23 12 4.69 | 1.8803 | 5 27 7.7 | 15.033 | 3 | 0 43 53.65 | 1.9745 | 6 56 38.9 | 15.529 |
| 4 | 23 13 57.51 | 1.8805 | 5 12 4.7 | 15.068 | 4 | 0 45 52.23 | 1.9783 | 7 12 10.1 | 15.511 |
| 5 | 23 15 50.35 | 1.8808 | 4 56 59.6 | 15.102 | 5 | 0 47 51.04 | 1.9822 | 7 27 40.2 | 15.492 |
| 6 | 23 17 43.21 | 1.8812 | 4 41 52.5 | 15.135 | 6 | 0 49 50.09 | 1.9863 | 7 43 9.1 | 15.470 |
| 7 | 23 19 36.09 | 1.8816 | 4 26 43.4 | 15.167 | 7 | 0 51 49.39 | 1.9904 | 7 58 36.6 | 15.448 |
| 8 | 23 21 29.00 | 1.8821 | 4 11 32.4 | 15.198 | 8 | 0 53 48.94 | 1.9946 | 8 14 2.8 | 15.424 |
| 9 | 23 23 21.94 | 1.8827 | 3 56 19.6 | 15.228 | 9 | 0 55 48.74 | 1.9988 | 8 29 27.5 | 15.398 |
| 10 | 23 25 14.92 | 1.8833 | 3 41 5.0 | 15.258 | 10 | 0 57 48.79 | 2.0030 | 8 44 50.6 | 15.371 |
| 11 | 23 27 7.94 | 1.8841 | 3 25 48.6 | 15.287 | 11 | 0 59 49.10 | 2.0074 | 9 0 12.0 | 15.342 |
| 12 | 23 29 1.01 | 1.8849 | 3 10 30.5 | 15.315 | 12 | 1 1 49.68 | 2.0119 | 9 15 31.7 | 15.313 |
| 13 | 23 30 54.13 | 1.8857 | 2 55 10.8 | 15.341 | 13 | 1 3 50.53 | 2.0164 | 9 30 49.6 | 15.282 |
| 14 | 23 32 47.30 | 1.8866 | 2 39 49.6 | 15.366 | 14 | 1 5 51.65 | 2.0210 | 9 46 5.6 | 15.250 |
| 15 | 23 34 40.52 | 1.8876 | 2 24 26.9 | 15.391 | 15 | 1 7 53.05 | 2.0257 | 10 1 19.6 | 15.217 |
| 16 | 23 36 33.81 | 1.8887 | 2 9 2.7 | 15.415 | 16 | 1 9 54.73 | 2.0304 | 10 16 31.6 | 15.182 |
| 17 | 23 38 27.17 | 1.8899 | 1 53 37.1 | 15.437 | 17 | 1 11 56.70 | 2.0353 | 10 31 41.4 | 15.144 |
| 18 | 23 40 20.60 | 1.8912 | 1 38 10.3 | 15.458 | 18 | 1 13 58.97 | 2.0403 | 10 46 48.9 | 15.106 |
| 19 | 23 42 14.11 | 1.8925 | 1 22 42.2 | 15.478 | 19 | 1 16 1.54 | 2.0453 | 11 1 54.1 | 15.067 |
| 20 | 23 44 7.70 | 1.8938 | 1 7 12.9 | 15.497 | 20 | 1 18 4.41 | 2.0503 | 11 16 56.9 | 15.026 |
| 21 | 23 46 1.37 | 1.8952 | 0 51 42.5 | 15.515 | 21 | 1 20 7.58 | 2.0553 | 11 31 57.2 | 14.983 |
| 22 | 23 47 55.13 | 1.8967 | 0 36 11.1 | 15.533 | 22 | 1 22 11.05 | 2.0605 | 11 46 54.9 | 14.939 |
| 23 | 23 49 48.98 | 1.8983 | S. 0 20 38.6 | 15.549 | 23 | 1 24 14.84 | 2.0658 | N.12 1 49.9 | 14.893 |
| | MONDAY 2. | | | | | WEDNESDAY 4. | | | |
| 0 | 23 51 42.93 | 1.9000 | S. 0 5 5.2 | 15.563 | 0 | 1 26 18.95 | 2.0712 | N.12 16 42.1 | 14.846 |
| 1 | 23 53 36.98 | 1.9018 | N. 0 10 29.0 | 15.577 | 1 | 1 28 23.38 | 2.0766 | 12 31 31.4 | 14.797 |
| 2 | 23 55 31.14 | 1.9037 | 0 26 4.0 | 15.590 | 2 | 1 30 28.14 | 2.0821 | 12 46 17.8 | 14.747 |
| 3 | 23 57 25.42 | 1.9056 | 0 41 39.8 | 15.602 | 3 | 1 32 33.23 | 2.0877 | 13 1 1.1 | 14.696 |
| 4 | 23 59 19.81 | 1.9075 | 0 57 16.3 | 15.613 | 4 | 1 34 38.66 | 2.0933 | 13 15 41.3 | 14.643 |
| 5 | 0 1 14.32 | 1.9096 | 1 12 53.4 | 15.622 | 5 | 1 36 44.43 | 2.0990 | 13 30 18.2 | 14.588 |
| 6 | 0 3 8.96 | 1.9117 | 1 28 31.0 | 15.630 | 6 | 1 38 50.54 | 2.1048 | 13 44 51.8 | 14.532 |
| 7 | 0 5 3.73 | 1.9139 | 1 44 9.0 | 15.638 | 7 | 1 40 57.00 | 2.1106 | 13 59 22.0 | 14.473 |
| 8 | 0 6 58.63 | 1.9162 | 1 59 47.5 | 15.644 | 8 | 1 43 3.81 | 2.1164 | 14 13 48.6 | 14.413 |
| 9 | 0 8 53.67 | 1.9186 | 2 15 26.3 | 15.648 | 9 | 1 45 10.97 | 2.1223 | 14 28 11.6 | 14.352 |
| 10 | 0 10 48.86 | 1.9211 | 2 31 5.3 | 15.652 | 10 | 1 47 18.49 | 2.1284 | 14 42 30.9 | 14.290 |
| 11 | 0 12 44.20 | 1.9236 | 2 46 44.5 | 15.654 | 11 | 1 49 26.38 | 2.1346 | 14 56 46.4 | 14.226 |
| 12 | 0 14 39.69 | 1.9262 | 3 2 23.8 | 15.656 | 12 | 1 51 34.64 | 2.1407 | 15 10 58.0 | 14.160 |
| 13 | 0 16 35.34 | 1.9288 | 3 18 3.2 | 15.657 | 13 | 1 53 43.27 | 2.1469 | 15 25 5.6 | 14.092 |
| 14 | 0 18 31.15 | 1.9316 | 3 33 42.6 | 15.656 | 14 | 1 55 52.27 | 2.1531 | 15 39 9.1 | 14.023 |
| 15 | 0 20 27.13 | 1.9345 | 3 49 21.9 | 15.653 | 15 | 1 58 1.64 | 2.1593 | 15 53 8.4 | 13.952 |
| 16 | 0 22 23.29 | 1.9374 | 4 5 1.0 | 15.649 | 16 | 2 0 11.39 | 2.1657 | 16 7 3.3 | 13.878 |
| 17 | 0 24 19.62 | 1.9403 | 4 20 39.8 | 15.644 | 17 | 2 2 21.53 | 2.1722 | 16 20 53.8 | 13.804 |
| 18 | 0 26 16.13 | 1.9433 | 4 36 18.3 | 15.638 | 18 | 2 4 32.06 | 2.1787 | 16 34 39.8 | 13.729 |
| 19 | 0 28 12.82 | 1.9464 | 4 51 56.4 | 15.632 | 19 | 2 6 42.98 | 2.1852 | 16 48 21.3 | 13.652 |
| 20 | 0 30 9.70 | 1.9497 | 5 7 34.1 | 15.624 | 20 | 2 8 54.29 | 2.1918 | 17 1 58.1 | 13.572 |
| 21 | 0 32 6.78 | 1.9530 | 5 23 11.3 | 15.615 | 21 | 2 11 6.00 | 2.1985 | 17 15 30.0 | 13.491 |
| 22 | 0 34 4.06 | 1.9564 | 5 38 47.9 | 15.604 | 22 | 2 13 18.11 | 2.2052 | 17 28 57.0 | 13.408 |
| 23 | 0 36 1.55 | 1.9599 | 5 54 23.8 | 15.592 | 23 | 2 15 30.62 | 2.2118 | 17 42 18.9 | 13.323 |
| 24 | 0 37 59.25 | 1.9634 | N. 6 9 58.9 | 15.578 | 24 | 2 17 43.53 | 2.2186 | N.17 55 35.7 | 13.238 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### THURSDAY 5.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 2 17 43.53 | 2.2186 | N.17 55 35.7 | 13.238 |
| 1 | 2 19 56.85 | 2.2254 | 18 8 47.4 | 13.151 |
| 2 | 2 22 10.58 | 2.2323 | 18 21 53.8 | 13.061 |
| 3 | 2 24 24.73 | 2.2392 | 18 34 54.7 | 12.969 |
| 4 | 2 26 39.29 | 2.2462 | 18 47 50.1 | 12.876 |
| 5 | 2 28 54.27 | 2.2532 | 19 0 39.8 | 12.781 |
| 6 | 2 31 9.67 | 2.2602 | 19 13 23.8 | 12.685 |
| 7 | 2 33 25.49 | 2.2672 | 19 26 2.0 | 12.587 |
| 8 | 2 35 41.74 | 2.2743 | 19 38 34.2 | 12.487 |
| 9 | 2 37 58.41 | 2.2814 | 19 51 0.4 | 12.386 |
| 10 | 2 40 15.51 | 2.2885 | 20 3 20.5 | 12.283 |
| 11 | 2 42 33.03 | 2.2956 | 20 15 34.3 | 12.177 |
| 12 | 2 44 50.98 | 2.3028 | 20 27 41.7 | 12.069 |
| 13 | 2 47 9.36 | 2.3100 | 20 39 42.6 | 11.961 |
| 14 | 2 49 28.18 | 2.3172 | 20 51 37.0 | 11.851 |
| 15 | 2 51 47.43 | 2.3244 | 21 3 24.7 | 11.738 |
| 16 | 2 54 7.11 | 2.3317 | 21 15 5.6 | 11.624 |
| 17 | 2 56 27.23 | 2.3389 | 21 26 39.6 | 11.509 |
| 18 | 2 58 47.78 | 2.3462 | 21 38 6.7 | 11.392 |
| 19 | 3 1 8.77 | 2.3534 | 21 49 26.7 | 11.272 |
| 20 | 3 3 30.19 | 2.3606 | 22 0 39.4 | 11.151 |
| 21 | 3 5 52.04 | 2.3679 | 22 11 44.8 | 11.028 |
| 22 | 3 8 14.33 | 2.3752 | 22 22 42.8 | 10.904 |
| 23 | 3 10 37.06 | 2.3824 | N.22 33 33.3 | 10.777 |

### FRIDAY 6.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 3 13 0.22 | 2.3896 | N.22 44 16.1 | 10.649 |
| 1 | 3 15 23.81 | 2.3968 | 22 54 51.2 | 10.520 |
| 2 | 3 17 47.83 | 2.4040 | 23 5 18.5 | 10.388 |
| 3 | 3 20 12.29 | 2.4112 | 23 15 37.8 | 10.255 |
| 4 | 3 22 37.18 | 2.4183 | 23 25 49.1 | 10.121 |
| 5 | 3 25 2.49 | 2.4254 | 23 35 52.3 | 9.984 |
| 6 | 3 27 28.23 | 2.4326 | 23 45 47.2 | 9.845 |
| 7 | 3 29 54.40 | 2.4397 | 23 55 33.7 | 9.705 |
| 8 | 3 32 20.99 | 2.4466 | 24 5 11.8 | 9.564 |
| 9 | 3 34 47.99 | 2.4535 | 24 14 41.4 | 9.421 |
| 10 | 3 37 15.41 | 2.4605 | 24 24 2.3 | 9.276 |
| 11 | 3 39 43.25 | 2.4675 | 24 33 14.5 | 9.129 |
| 12 | 3 42 11.51 | 2.4744 | 24 42 17.8 | 8.981 |
| 13 | 3 44 40.18 | 2.4812 | 24 51 12.2 | 8.831 |
| 14 | 3 47 9.25 | 2.4878 | 24 59 57.5 | 8.679 |
| 15 | 3 49 38.72 | 2.4945 | 25 8 33.7 | 8.526 |
| 16 | 3 52 8.59 | 2.5012 | 25 17 0.6 | 8.371 |
| 17 | 3 54 38.86 | 2.5078 | 25 25 18.2 | 8.215 |
| 18 | 3 57 9.52 | 2.5143 | 25 33 26.4 | 8.057 |
| 19 | 3 59 40.57 | 2.5207 | 25 41 25.1 | 7.898 |
| 20 | 4 2 12.00 | 2.5270 | 25 49 14.2 | 7.737 |
| 21 | 4 4 43.81 | 2.5332 | 25 56 53.6 | 7.575 |
| 22 | 4 7 15.99 | 2.5393 | 26 4 23.2 | 7.411 |
| 23 | 4 9 48.53 | 2.5453 | 26 11 42.9 | 7.246 |
| 24 | 4 12 21.43 | 2.5513 | N.26 18 52.7 | 7.079 |

### SATURDAY 7.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 4 12 21.43 | 2.5513 | N.26 18 52.7 | 7.079 |
| 1 | 4 14 54.69 | 2.5573 | 26 25 52.4 | 6.911 |
| 2 | 4 17 28.31 | 2.5632 | 26 32 42.0 | 6.742 |
| 3 | 4 20 2.27 | 2.5689 | 26 39 21.4 | 6.571 |
| 4 | 4 22 36.57 | 2.5744 | 26 45 50.5 | 6.399 |
| 5 | 4 25 11.20 | 2.5798 | 26 52 9.3 | 6.226 |
| 6 | 4 27 46.15 | 2.5852 | 26 58 17.6 | 6.051 |
| 7 | 4 30 21.42 | 2.5905 | 27 4 15.4 | 5.875 |
| 8 | 4 32 57.01 | 2.5957 | 27 10 2.6 | 5.697 |
| 9 | 4 35 32.90 | 2.6007 | 27 15 39.1 | 5.519 |
| 10 | 4 38 9.09 | 2.6055 | 27 21 4.9 | 5.340 |
| 11 | 4 40 45.56 | 2.6102 | 27 26 19.9 | 5.159 |
| 12 | 4 43 22.31 | 2.6148 | 27 31 24.0 | 4.977 |
| 13 | 4 45 59.34 | 2.6193 | 27 36 17.1 | 4.794 |
| 14 | 4 48 36.63 | 2.6237 | 27 40 59.2 | 4.610 |
| 15 | 4 51 14.18 | 2.6279 | 27 45 30.3 | 4.426 |
| 16 | 4 53 51.98 | 2.6320 | 27 49 50.3 | 4.240 |
| 17 | 4 56 30.02 | 2.6359 | 27 53 59.1 | 4.053 |
| 18 | 4 59 8.29 | 2.6397 | 27 57 56.7 | 3.866 |
| 19 | 5 1 46.78 | 2.6433 | 28 1 43.0 | 3.677 |
| 20 | 5 4 25.49 | 2.6468 | 28 5 17.9 | 3.486 |
| 21 | 5 7 4.40 | 2.6501 | 28 8 41.3 | 3.295 |
| 22 | 5 9 43.50 | 2.6532 | 28 11 53.3 | 3.105 |
| 23 | 5 12 22.79 | 2.6562 | N.28 14 53.9 | 2.914 |

### SUNDAY 8.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 5 15 2.25 | 2.6591 | N.28 17 43.0 | 2.722 |
| 1 | 5 17 41.88 | 2.6618 | 28 20 20.5 | 2.528 |
| 2 | 5 20 21.66 | 2.6643 | 28 22 46.4 | 2.334 |
| 3 | 5 23 1.59 | 2.6666 | 28 25 0.6 | 2.140 |
| 4 | 5 25 41.65 | 2.6688 | 28 27 3.2 | 1.946 |
| 5 | 5 28 21.84 | 2.6708 | 28 28 54.1 | 1.751 |
| 6 | 5 31 2.14 | 2.6726 | 28 30 33.3 | 1.555 |
| 7 | 5 33 42.55 | 2.6742 | 28 32 0.7 | 1.358 |
| 8 | 5 36 23.05 | 2.6757 | 28 33 16.3 | 1.162 |
| 9 | 5 39 3.63 | 2.6769 | 28 34 20.1 | 0.965 |
| 10 | 5 41 44.28 | 2.6781 | 28 35 12.1 | 0.768 |
| 11 | 5 44 25.00 | 2.6791 | 28 35 52.3 | 0.572 |
| 12 | 5 47 5.77 | 2.6798 | 28 36 20.7 | 0.374 |
| 13 | 5 49 46.58 | 2.6804 | 28 36 37.2 | +0.176 |
| 14 | 5 52 27.42 | 2.6808 | 28 36 41.8 | −0.022 |
| 15 | 5 55 8.28 | 2.6811 | 28 36 34.6 | 0.219 |
| 16 | 5 57 49.15 | 2.6812 | 28 36 15.5 | 0.417 |
| 17 | 6 0 30.02 | 2.6810 | 28 35 44.5 | 0.616 |
| 18 | 6 3 10.87 | 2.6807 | 28 35 1.6 | 0.814 |
| 19 | 6 5 51.70 | 2.6802 | 28 34 6.9 | 1.011 |
| 20 | 6 8 32.50 | 2.6796 | 28 33 0.3 | 1.209 |
| 21 | 6 11 13.25 | 2.6787 | 28 31 41.8 | 1.407 |
| 22 | 6 13 53.95 | 2.6777 | 28 30 11.5 | 1.604 |
| 23 | 6 16 34.58 | 2.6766 | 28 28 29.4 | 1.800 |
| 24 | 6 19 15.14 | 2.6753 | N.28 26 35.5 | 1.997 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | MONDAY 9. | | | | | WEDNESDAY 11. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 6 19 15.14 | 2.6753 | N.28 26 35.5 | 1.997 | 0 | 8 23 22.07 | 2.4548 | N.23 18 53.8 | 10.383 |
| 1 | 6 21 55.61 | 2.6738 | 28 24 29.8 | 2.193 | 1 | 8 25 49.16 | 2.4482 | 23 8 26.5 | 10.526 |
| 2 | 6 24 35.99 | 2.6721 | 28 22 12.3 | 2.389 | 2 | 8 28 15.86 | 2.4417 | 22 57 50.7 | 10.666 |
| 3 | 6 27 16.26 | 2.6702 | 28 19 43.1 | 2.584 | 3 | 8 30 42.16 | 2.4350 | 22 47 6.6 | 10.804 |
| 4 | 6 29 56.41 | 2.6682 | 28 17 2.2 | 2.779 | 4 | 8 33 8.06 | 2.4284 | 22 36 14.2 | 10.941 |
| 5 | 6 32 36.44 | 2.6660 | 28 14 9.6 | 2.974 | 5 | 8 35 33.57 | 2.4218 | 22 25 13.7 | 11.076 |
| 6 | 6 35 16.33 | 2.6637 | 28 11 5.3 | 3.168 | 6 | 8 37 58.68 | 2.4152 | 22 14 5.1 | 11.210 |
| 7 | 6 37 56.08 | 2.6612 | 28 7 49.4 | 3.361 | 7 | 8 40 23.39 | 2.4085 | 22 2 48.5 | 11.342 |
| 8 | 6 40 35.67 | 2.6584 | 28 4 22.0 | 3.553 | 8 | 8 42 47.70 | 2.4019 | 21 51 24.1 | 11.472 |
| 9 | 6 43 15.09 | 2.6556 | 28 0 43.0 | 3.746 | 9 | 8 45 11.62 | 2.3953 | 21 39 51.9 | 11.601 |
| 10 | 6 45 54.34 | 2.6527 | 27 56 52.5 | 3.938 | 10 | 8 47 35.14 | 2.3887 | 21 28 12.0 | 11.728 |
| 11 | 6 48 33.41 | 2.6496 | 27 52 50.5 | 4.128 | 11 | 8 49 58.26 | 2.3820 | 21 16 24.6 | 11.853 |
| 12 | 6 51 12.29 | 2.6463 | 27 48 37.2 | 4.317 | 12 | 8 52 20.98 | 2.3753 | 21 4 29.7 | 11.977 |
| 13 | 6 53 50.96 | 2.6428 | 27 44 12.5 | 4.506 | 13 | 8 54 43.30 | 2.3687 | 20 52 27.4 | 12.098 |
| 14 | 6 56 29.42 | 2.6393 | 27 39 36.5 | 4.694 | 14 | 8 57 5.23 | 2.3622 | 20 40 17.9 | 12.218 |
| 15 | 6 59 7.67 | 2.6356 | 27 34 49.2 | 4.882 | 15 | 8 59 26.76 | 2.3556 | 20 28 1.3 | 12.336 |
| 16 | 7 1 45.69 | 2.6317 | 27 29 50.7 | 5.068 | 16 | 9 1 47.90 | 2.3490 | 20 15 37.6 | 12.453 |
| 17 | 7 4 23.47 | 2.6277 | 27 24 41.1 | 5.253 | 17 | 9 4 8.64 | 2.3424 | 20 3 7.0 | 12.568 |
| 18 | 7 7 1.01 | 2.6236 | 27 19 20.4 | 5.438 | 18 | 9 6 28.99 | 2.3359 | 19 50 29.5 | 12.681 |
| 19 | 7 9 38.30 | 2.6193 | 27 13 48.6 | 5.622 | 19 | 9 8 48.95 | 2.3294 | 19 37 45.3 | 12.792 |
| 20 | 7 12 15.33 | 2.6149 | 27 8 5.8 | 5.804 | 20 | 9 11 8.52 | 2.3229 | 19 24 54.4 | 12.902 |
| 21 | 7 14 52.09 | 2.6104 | 27 2 12.1 | 5.986 | 21 | 9 13 27.70 | 2.3165 | 19 11 57.0 | 13.010 |
| 22 | 7 17 28.58 | 2.6058 | 26 56 7.5 | 6.166 | 22 | 9 15 46.50 | 2.3102 | 18 58 53.2 | 13.116 |
| 23 | 7 20 4.79 | 2.6010 | N.26 49 52.2 | 6.344 | 23 | 9 18 4.92 | 2.3038 | N.18 45 43.1 | 13.221 |
| | TUESDAY 10. | | | | | THURSDAY 12. | | | |
| 0 | 7 22 40.70 | 2.5961 | N.26 43 26.2 | 6.522 | 0 | 9 20 22.95 | 2.2974 | N.18 32 26.7 | 13.324 |
| 1 | 7 25 16.32 | 2.5912 | 26 36 49.5 | 6.699 | 1 | 9 22 40.60 | 2.2911 | 18 19 4.2 | 13.425 |
| 2 | 7 27 51.64 | 2.5862 | 26 30 2.3 | 6.874 | 2 | 9 24 57.88 | 2.2849 | 18 5 35.7 | 13.524 |
| 3 | 7 30 26.66 | 2.5810 | 26 23 4.6 | 7.048 | 3 | 9 27 14.79 | 2.2787 | 17 52 1.3 | 13.622 |
| 4 | 7 33 1.36 | 2.5757 | 26 15 56.5 | 7.222 | 4 | 9 29 31.32 | 2.2724 | 17 38 21.1 | 13.718 |
| 5 | 7 35 35.74 | 2.5703 | 26 8 38.0 | 7.393 | 5 | 9 31 47.48 | 2.2662 | 17 24 35.2 | 13.812 |
| 6 | 7 38 9.80 | 2.5649 | 26 1 9.3 | 7.563 | 6 | 9 34 3.27 | 2.2602 | 17 10 43.7 | 13.904 |
| 7 | 7 40 43.53 | 2.5593 | 25 53 30.4 | 7.732 | 7 | 9 36 18.70 | 2.2542 | 16 56 46.7 | 13.996 |
| 8 | 7 43 16.92 | 2.5536 | 25 45 41.4 | 7.900 | 8 | 9 38 33.77 | 2.2482 | 16 42 44.2 | 14.086 |
| 9 | 7 45 49.97 | 2.5479 | 25 37 42.4 | 8.067 | 9 | 9 40 48.48 | 2.2423 | 16 28 36.4 | 14.178 |
| 10 | 7 48 22.67 | 2.5422 | 25 29 33.4 | 8.232 | 10 | 9 43 2.84 | 2.2364 | 16 14 23.4 | 14.258 |
| 11 | 7 50 55.03 | 2.5363 | 25 21 14.6 | 8.395 | 11 | 9 45 16.85 | 2.2306 | 16 0 5.4 | 14.342 |
| 12 | 7 53 27.03 | 2.5303 | 25 12 46.0 | 8.557 | 12 | 9 47 30.51 | 2.2248 | 15 45 42.4 | 14.424 |
| 13 | 7 55 58.67 | 2.5243 | 25 4 7.7 | 8.718 | 13 | 9 49 43.83 | 2.2191 | 15 31 14.5 | 14.505 |
| 14 | 7 58 29.95 | 2.5182 | 24 55 19.8 | 8.877 | 14 | 9 51 56.80 | 2.2134 | 15 16 41.8 | 14.584 |
| 15 | 8 1 0.86 | 2.5121 | 24 46 22.5 | 9.034 | 15 | 9 54 9.44 | 2.2079 | 15 2 4.4 | 14.662 |
| 16 | 8 3 31.40 | 2.5059 | 24 37 15.8 | 9.190 | 16 | 9 56 21.75 | 2.2024 | 14 47 22.4 | 14.738 |
| 17 | 8 6 1.57 | 2.4996 | 24 27 59.7 | 9.346 | 17 | 9 58 33.73 | 2.1969 | 14 32 35.9 | 14.812 |
| 18 | 8 8 31.36 | 2.4933 | 24 18 34.3 | 9.499 | 18 | 10 0 45.38 | 2.1915 | 14 17 45.0 | 14.883 |
| 19 | 8 11 0.77 | 2.4870 | 24 8 59.8 | 9.650 | 19 | 10 2 56.71 | 2.1862 | 14 2 49.9 | 14.953 |
| 20 | 8 13 29.80 | 2.4806 | 23 59 16.3 | 9.799 | 20 | 10 5 7.72 | 2.1809 | 13 47 50.6 | 15.022 |
| 21 | 8 15 58.44 | 2.4742 | 23 49 23.9 | 9.948 | 21 | 10 7 18.42 | 2.1757 | 13 32 47.2 | 15.090 |
| 22 | 8 18 26.70 | 2.4678 | 23 39 22.6 | 10.095 | 22 | 10 9 28.81 | 2.1706 | 13 17 39.8 | 15.156 |
| 23 | 8 20 54.58 | 2.4614 | 23 29 12.5 | 10.240 | 23 | 10 11 38.89 | 2.1655 | 13 2 28.5 | 15.220 |
| 24 | 8 23 22.07 | 2.4548 | N.23 18 53.8 | 10.383 | 24 | 10 13 48.67 | 2.1606 | N.12 47 13.4 | 15.282 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| **FRIDAY 13.** | | | | | **SUNDAY 15.** | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 10 13 48.67 | 2.1606 | N.12 47 13.4 | 15.282 | 0 | 11 53 15.41 | 2.0141 | S. 0 8 29.7 | 16.462 |
| 1 | 10 15 58.16 | 2.1557 | 12 31 54.6 | 15.343 | 1 | 11 55 16.22 | 2.0130 | 0 24 57.1 | 16.451 |
| 2 | 10 18 7.35 | 2.1508 | 12 16 32.2 | 15.402 | 2 | 11 57 16.97 | 2.0120 | 0 41 23.8 | 16.439 |
| 3 | 10 20 16.25 | 2.1460 | 12 1 6.3 | 15.460 | 3 | 11 59 17.66 | 2.0111 | 0 57 49.8 | 16.427 |
| 4 | 10 22 24.87 | 2.1413 | 11 45 37.0 | 15.516 | 4 | 12 1 18.30 | 2.0102 | 1 14 15.0 | 16.412 |
| 5 | 10 24 33.21 | 2.1367 | 11 30 4.4 | 15.570 | 5 | 12 3 18.89 | 2.0095 | 1 30 39.2 | 16.394 |
| 6 | 10 26 41.28 | 2.1322 | 11 14 28.6 | 15.622 | 6 | 12 5 19.44 | 2.0089 | 1 47 2.3 | 16.376 |
| 7 | 10 28 49.08 | 2.1277 | 10 58 49.7 | 15.674 | 7 | 12 7 19.96 | 2.0083 | 2 3 24.3 | 16.357 |
| 8 | 10 30 56.61 | 2.1233 | 10 43 7.7 | 15.724 | 8 | 12 9 20.44 | 2.0077 | 2 19 45.1 | 16.337 |
| 9 | 10 33 3.88 | 2.1191 | 10 27 22.8 | 15.772 | 9 | 12 11 20.89 | 2.0072 | 2 36 4.7 | 16.315 |
| 10 | 10 35 10.90 | 2.1149 | 10 11 35.1 | 15.818 | 10 | 12 13 21.31 | 2.0068 | 2 52 22.9 | 16.292 |
| 11 | 10 37 17.67 | 2.1108 | 9 55 44.7 | 15.863 | 11 | 12 15 21.71 | 2.0066 | 3 8 39.7 | 16.267 |
| 12 | 10 39 24.19 | 2.1067 | 9 39 51.6 | 15.907 | 12 | 12 17 22.10 | 2.0064 | 3 24 54.9 | 16.240 |
| 13 | 10 41 30.47 | 2.1027 | 9 23 55.9 | 15.948 | 13 | 12 19 22.48 | 2.0063 | 3 41 8.5 | 16.213 |
| 14 | 10 43 36.51 | 2.0988 | 9 7 57.8 | 15.987 | 14 | 12 21 22.86 | 2.0062 | 3 57 20.5 | 16.186 |
| 15 | 10 45 42.32 | 2.0949 | 8 51 57.4 | 16.026 | 15 | 12 23 23.23 | 2.0062 | 4 13 30.8 | 16.156 |
| 16 | 10 47 47.90 | 2.0911 | 8 35 54.7 | 16.063 | 16 | 12 25 23.61 | 2.0063 | 4 29 39.2 | 16.124 |
| 17 | 10 49 53.25 | 2.0873 | 8 19 49.8 | 16.099 | 17 | 12 27 23.99 | 2.0064 | 4 45 45.7 | 16.092 |
| 18 | 10 51 58.38 | 2.0837 | 8 3 42.8 | 16.133 | 18 | 12 29 24.38 | 2.0067 | 5 1 50.2 | 16.058 |
| 19 | 10 54 3.30 | 2.0803 | 7 47 33.9 | 16.165 | 19 | 12 31 24.79 | 2.0070 | 5 17 52.6 | 16.023 |
| 20 | 10 56 8.02 | 2.0769 | 7 31 23.0 | 16.197 | 20 | 12 33 25.22 | 2.0074 | 5 33 52.9 | 15.987 |
| 21 | 10 58 12.53 | 2.0735 | 7 15 10.3 | 16.226 | 21 | 12 35 25.68 | 2.0078 | 5 49 51.0 | 15.949 |
| 22 | 11 0 16.84 | 2.0702 | 6 58 55.9 | 16.253 | 22 | 12 37 26.16 | 2.0082 | 6 5 46.8 | 15.910 |
| 23 | 11 2 20.96 | 2.0671 | N. 6 42 39.9 | 16.279 | 23 | 12 39 26.67 | 2.0088 | S. 6 21 40.2 | 15.869 |
| **SATURDAY 14.** | | | | | **MONDAY 16.** | | | | |
| 0 | 11 4 24.89 | 2.0640 | N. 6 26 22.4 | 16.304 | 0 | 12 41 27.22 | 2.0095 | S. 6 37 31.1 | 15.827 |
| 1 | 11 6 28.64 | 2.0610 | 6 10 3.4 | 16.327 | 1 | 12 43 27.81 | 2.0103 | 6 53 19.5 | 15.785 |
| 2 | 11 8 32.21 | 2.0580 | 5 53 43.1 | 16.349 | 2 | 12 45 28.45 | 2.0111 | 7 9 5.3 | 15.742 |
| 3 | 11 10 35.60 | 2.0551 | 5 37 21.5 | 16.370 | 3 | 12 47 29.14 | 2.0119 | 7 24 48.5 | 15.697 |
| 4 | 11 12 38.82 | 2.0523 | 5 20 58.7 | 16.389 | 4 | 12 49 29.88 | 2.0128 | 7 40 28.9 | 15.649 |
| 5 | 11 14 41.88 | 2.0496 | 5 4 34.8 | 16.407 | 5 | 12 51 30.67 | 2.0137 | 7 56 6.4 | 15.601 |
| 6 | 11 16 44.78 | 2.0470 | 4 48 9.9 | 16.423 | 6 | 12 53 31.52 | 2.0148 | 8 11 41.0 | 15.552 |
| 7 | 11 18 47.52 | 2.0445 | 4 31 44.1 | 16.437 | 7 | 12 55 32.44 | 2.0160 | 8 27 12.7 | 15.502 |
| 8 | 11 20 50.12 | 2.0422 | 4 15 17.5 | 16.450 | 8 | 12 57 33.44 | 2.0172 | 8 42 41.3 | 15.451 |
| 9 | 11 22 52.58 | 2.0398 | 3 58 50.1 | 16.462 | 9 | 12 59 34.51 | 2.0184 | 8 58 6.8 | 15.398 |
| 10 | 11 24 54.90 | 2.0375 | 3 42 22.1 | 16.471 | 10 | 13 1 35.65 | 2.0197 | 9 13 29.1 | 15.344 |
| 11 | 11 26 57.08 | 2.0353 | 3 25 53.6 | 16.479 | 11 | 13 3 36.87 | 2.0211 | 9 28 48.1 | 15.288 |
| 12 | 11 28 59.13 | 2.0332 | 3 9 24.6 | 16.487 | 12 | 13 5 38.18 | 2.0226 | 9 44 3.7 | 15.232 |
| 13 | 11 31 1.06 | 2.0312 | 2 52 55.2 | 16.493 | 13 | 13 7 39.58 | 2.0240 | 9 59 15.9 | 15.174 |
| 14 | 11 33 2.87 | 2.0292 | 2 36 25.5 | 16.497 | 14 | 13 9 41.06 | 2.0255 | 10 14 24.6 | 15.116 |
| 15 | 11 35 4.57 | 2.0273 | 2 19 55.6 | 16.499 | 15 | 13 11 42.64 | 2.0271 | 10 29 29.8 | 15.056 |
| 16 | 11 37 6.15 | 2.0254 | 2 3 25.6 | 16.501 | 16 | 13 13 44.32 | 2.0288 | 10 44 31.3 | 14.994 |
| 17 | 11 39 7.62 | 2.0237 | 1 46 55.5 | 16.502 | 17 | 13 15 46.10 | 2.0305 | 10 59 29.1 | 14.932 |
| 18 | 11 41 8.99 | 2.0221 | 1 30 25.4 | 16.501 | 18 | 13 17 47.98 | 2.0323 | 11 14 23.1 | 14.868 |
| 19 | 11 43 10.27 | 2.0206 | 1 13 55.4 | 16.498 | 19 | 13 19 49.97 | 2.0341 | 11 29 13.3 | 14.803 |
| 20 | 11 45 11.46 | 2.0191 | 0 57 25.6 | 16.494 | 20 | 13 21 52.07 | 2.0360 | 11 43 59.5 | 14.737 |
| 21 | 11 47 12.56 | 2.0177 | 0 40 56.1 | 16.488 | 21 | 13 23 54.29 | 2.0380 | 11 58 41.7 | 14.669 |
| 22 | 11 49 13.58 | 2.0164 | 0 24 27.0 | 16.481 | 22 | 13 25 56.63 | 2.0400 | 12 13 19.8 | 14.601 |
| 23 | 11 51 14.53 | 2.0152 | N. 0 7 58.4 | 16.472 | 23 | 13 27 59.09 | 2.0420 | 12 27 53.8 | 14.532 |
| 24 | 11 53 15.41 | 2.0141 | S. 0 8 29.7 | 16.462 | 24 | 13 30 1.67 | 2.0441 | S.12 42 23.6 | 14.461 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### TUESDAY 17.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 13 30 1.67 | 2.0441 | S. 12 42 23.6 | 14.461 |
| 1 | 13 32 4.38 | 2.0462 | 12 56 49.1 | 14.389 |
| 2 | 13 34 7.22 | 2.0484 | 13 11 10.3 | 14.316 |
| 3 | 13 36 10.19 | 2.0507 | 13 25 27.0 | 14.241 |
| 4 | 13 38 13.30 | 2.0530 | 13 39 39.2 | 14.166 |
| 5 | 13 40 16.55 | 2.0553 | 13 53 46.9 | 14.089 |
| 6 | 13 42 19.94 | 2.0577 | 14 7 49.9 | 14.011 |
| 7 | 13 44 23.47 | 2.0601 | 14 21 48.2 | 13.932 |
| 8 | 13 46 27.15 | 2.0626 | 14 35 41.7 | 13.852 |
| 9 | 13 48 30.98 | 2.0651 | 14 49 30.5 | 13.772 |
| 10 | 13 50 34.96 | 2.0676 | 15 3 14.4 | 13.690 |
| 11 | 13 52 39.09 | 2.0702 | 15 16 53.3 | 13.606 |
| 12 | 13 54 43.38 | 2.0728 | 15 30 27.1 | 13.521 |
| 13 | 13 56 47.83 | 2.0755 | 15 43 55.8 | 13.435 |
| 14 | 13 58 52.44 | 2.0782 | 15 57 19.3 | 13.349 |
| 15 | 14 0 57.21 | 2.0809 | 16 10 37.7 | 13.262 |
| 16 | 14 3 2.15 | 2.0837 | 16 23 50.8 | 13.173 |
| 17 | 14 5 7.26 | 2.0865 | 16 36 58.5 | 13.082 |
| 18 | 14 7 12.58 | 2.0893 | 16 50 0.7 | 12.991 |
| 19 | 14 9 17.97 | 2.0922 | 17 2 57.4 | 12.899 |
| 20 | 14 11 23.59 | 2.0952 | 17 15 48.6 | 12.807 |
| 21 | 14 13 29.39 | 2.0981 | 17 28 34.2 | 12.713 |
| 22 | 14 15 35.36 | 2.1009 | 17 41 14.1 | 12.618 |
| 23 | 14 17 41.50 | 2.1038 | S. 17 53 48.3 | 12.521 |

### WEDNESDAY 18.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 14 19 47.82 | 2.1068 | S. 18 6 16.6 | 12.424 |
| 1 | 14 21 54.32 | 2.1098 | 18 18 39.1 | 12.326 |
| 2 | 14 24 1.00 | 2.1129 | 18 30 55.7 | 12.226 |
| 3 | 14 26 7.87 | 2.1160 | 18 43 6.2 | 12.125 |
| 4 | 14 28 14.92 | 2.1190 | 18 55 10.7 | 12.024 |
| 5 | 14 30 22.15 | 2.1221 | 19 7 9.1 | 11.922 |
| 6 | 14 32 29.57 | 2.1252 | 19 19 1.4 | 11.819 |
| 7 | 14 34 37.18 | 2.1283 | 19 30 47.4 | 11.714 |
| 8 | 14 36 44.97 | 2.1314 | 19 42 27.1 | 11.609 |
| 9 | 14 38 52.95 | 2.1346 | 19 54 0.5 | 11.503 |
| 10 | 14 41 1.12 | 2.1377 | 20 5 27.5 | 11.396 |
| 11 | 14 43 9.48 | 2.1408 | 20 16 48.0 | 11.288 |
| 12 | 14 45 18.02 | 2.1439 | 20 28 2.0 | 11.179 |
| 13 | 14 47 26.75 | 2.1471 | 20 39 9.5 | 11.069 |
| 14 | 14 49 35.67 | 2.1503 | 20 50 10.3 | 10.957 |
| 15 | 14 51 44.79 | 2.1536 | 21 1 4.4 | 10.845 |
| 16 | 14 53 54.10 | 2.1567 | 21 11 51.7 | 10.733 |
| 17 | 14 56 3.59 | 2.1598 | 21 22 32.3 | 10.620 |
| 18 | 14 58 13.27 | 2.1629 | 21 33 6.1 | 10.506 |
| 19 | 15 0 23.14 | 2.1661 | 21 43 33.0 | 10.390 |
| 20 | 15 2 33.20 | 2.1692 | 21 53 52.9 | 10.274 |
| 21 | 15 4 43.45 | 2.1723 | 22 4 5.8 | 10.157 |
| 22 | 15 6 53.88 | 2.1754 | 22 14 11.7 | 10.039 |
| 23 | 15 9 4.50 | 2.1786 | 22 24 10.5 | 9.920 |
| 24 | 15 11 15.31 | 2.1817 | S. 22 34 2.1 | 9.800 |

### THURSDAY 19.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 15 11 15.31 | 2.1817 | S. 22 34 2.1 | 9.800 |
| 1 | 15 13 26.30 | 2.1847 | 22 43 46.5 | 9.680 |
| 2 | 15 15 37.48 | 2.1878 | 22 53 23.7 | 9.559 |
| 3 | 15 17 48.84 | 2.1908 | 23 2 53.6 | 9.438 |
| 4 | 15 20 0.38 | 2.1938 | 23 12 16.2 | 9.315 |
| 5 | 15 22 12.10 | 2.1969 | 23 21 31.4 | 9.191 |
| 6 | 15 24 24.01 | 2.2000 | 23 30 39.1 | 9.066 |
| 7 | 15 26 36.10 | 2.2029 | 23 39 39.3 | 8.941 |
| 8 | 15 28 48.36 | 2.2058 | 23 48 32.0 | 8.816 |
| 9 | 15 31 0.79 | 2.2086 | 23 57 17.2 | 8.689 |
| 10 | 15 33 13.39 | 2.2115 | 24 5 54.7 | 8.561 |
| 11 | 15 35 26.17 | 2.2144 | 24 14 24.5 | 8.432 |
| 12 | 15 37 39.12 | 2.2172 | 24 22 46.6 | 8.304 |
| 13 | 15 39 52.24 | 2.2200 | 24 31 1.0 | 8.176 |
| 14 | 15 42 5.52 | 2.2227 | 24 39 7.7 | 8.047 |
| 15 | 15 44 18.96 | 2.2253 | 24 47 6.6 | 7.916 |
| 16 | 15 46 32.56 | 2.2280 | 24 54 57.6 | 7.784 |
| 17 | 15 48 46.32 | 2.2307 | 25 2 40.6 | 7.651 |
| 18 | 15 51 0.24 | 2.2333 | 25 10 15.7 | 7.519 |
| 19 | 15 53 14.31 | 2.2358 | 25 17 42.9 | 7.386 |
| 20 | 15 55 28.53 | 2.2383 | 25 25 2.1 | 7.252 |
| 21 | 15 57 42.90 | 2.2407 | 25 32 13.2 | 7.118 |
| 22 | 15 59 57.41 | 2.2430 | 25 39 16.3 | 6.984 |
| 23 | 16 2 12.06 | 2.2453 | S. 25 46 11.3 | 6.848 |

### FRIDAY 20.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 16 4 26.85 | 2.2476 | S. 25 52 58.1 | 6.713 |
| 1 | 16 6 41.77 | 2.2499 | 25 59 36.8 | 6.577 |
| 2 | 16 8 56.83 | 2.2521 | 26 6 7.3 | 6.439 |
| 3 | 16 11 12.02 | 2.2542 | 26 12 29.5 | 6.302 |
| 4 | 16 13 27.33 | 2.2562 | 26 18 43.5 | 6.164 |
| 5 | 16 15 42.76 | 2.2582 | 26 24 49.2 | 6.026 |
| 6 | 16 17 58.31 | 2.2602 | 26 30 46.6 | 5.887 |
| 7 | 16 20 13.98 | 2.2621 | 26 36 35.7 | 5.748 |
| 8 | 16 22 29.76 | 2.2639 | 26 42 16.4 | 5.608 |
| 9 | 16 24 45.65 | 2.2657 | 26 47 48.7 | 5.468 |
| 10 | 16 27 1.64 | 2.2673 | 26 53 12.6 | 5.328 |
| 11 | 16 29 17.73 | 2.2689 | 26 58 28.1 | 5.188 |
| 12 | 16 31 33.91 | 2.2704 | 27 3 35.2 | 5.047 |
| 13 | 16 33 50.18 | 2.2719 | 27 8 33.8 | 4.906 |
| 14 | 16 36 6.54 | 2.2733 | 27 13 23.9 | 4.764 |
| 15 | 16 38 22.98 | 2.2747 | 27 18 5.5 | 4.622 |
| 16 | 16 40 39.50 | 2.2760 | 27 22 38.6 | 4.480 |
| 17 | 16 42 56.10 | 2.2772 | 27 27 3.1 | 4.337 |
| 18 | 16 45 12.77 | 2.2783 | 27 31 19.1 | 4.195 |
| 19 | 16 47 29.50 | 2.2793 | 27 35 26.5 | 4.052 |
| 20 | 16 49 46.29 | 2.2803 | 27 39 25.3 | 3.909 |
| 21 | 16 52 3.13 | 2.2812 | 27 43 15.6 | 3.767 |
| 22 | 16 54 20.03 | 2.2820 | 27 46 57.3 | 3.623 |
| 23 | 16 56 36.97 | 2.2827 | 27 50 30.3 | 3.479 |
| 24 | 16 58 53.95 | 2.2833 | S. 27 53 54.7 | 3.335 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | SATURDAY 21. | | | | | MONDAY 23. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 16 58 53.95 | 2.2833 | S.27 53 54.7 | 3.335 | 0 | 18 47 43.88 | 2.2217 | S.27 49 27.4 | 3.427 |
| 1 | 17 1 10.97 | 2.2839 | 27 57 10.5 | 3.191 | 1 | 18 49 57.09 | 2.2186 | 27 45 57.8 | 3.559 |
| 2 | 17 3 28.02 | 2.2844 | 28 0 17.6 | 3.047 | 2 | 18 52 10.11 | 2.2155 | 27 42 20.3 | 3.691 |
| 3 | 17 5 45.10 | 2.2849 | 28 3 16.1 | 2.902 | 3 | 18 54 22.95 | 2.2124 | 27 38 34.9 | 3.822 |
| 4 | 17 8 2.21 | 2.2853 | 28 6 5.9 | 2.758 | 4 | 18 56 35.60 | 2.2093 | 27 34 41.7 | 3.952 |
| 5 | 17 10 19.34 | 2.2856 | 28 8 47.1 | 2.615 | 5 | 18 58 48.06 | 2.2061 | 27 30 40.6 | 4.082 |
| 6 | 17 12 36.48 | 2.2857 | 28 11 19.7 | 2.471 | 6 | 19 1 0.33 | 2.2028 | 27 26 31.8 | 4.212 |
| 7 | 17 14 53.63 | 2.2858 | 28 13 43.6 | 2.326 | 7 | 19 3 12.40 | 2.1995 | 27 22 15.2 | 4.341 |
| 8 | 17 17 10.78 | 2.2858 | 28 15 58.8 | 2.182 | 8 | 19 5 24.27 | 2.1961 | 27 17 50.9 | 4.469 |
| 9 | 17 19 27.93 | 2.2857 | 28 18 5.4 | 2.037 | 9 | 19 7 35.93 | 2.1927 | 27 13 19.0 | 4.596 |
| 10 | 17 21 45.07 | 2.2856 | 28 20 3.3 | 1.893 | 10 | 19 9 47.39 | 2.1892 | 27 8 39.4 | 4.723 |
| 11 | 17 24 2.20 | 2.2853 | 28 21 52.6 | 1.749 | 11 | 19 11 58.64 | 2.1857 | 27 3 52.2 | 4.850 |
| 12 | 17 26 19.31 | 2.2850 | 28 23 33.2 | 1.604 | 12 | 19 14 9.68 | 2.1822 | 26 58 57.4 | 4.976 |
| 13 | 17 28 36.40 | 2.2847 | 28 25 5.1 | 1.460 | 13 | 19 16 20.50 | 2.1786 | 26 53 55.1 | 5.100 |
| 14 | 17 30 53.47 | 2.2843 | 28 26 28.4 | 1.317 | 14 | 19 18 31.11 | 2.1751 | 26 48 45.4 | 5.224 |
| 15 | 17 33 10.51 | 2.2837 | 28 27 43.1 | 1.173 | 15 | 19 20 41.51 | 2.1715 | 26 43 28.2 | 5.348 |
| 16 | 17 35 27.51 | 2.2829 | 28 28 49.2 | 1.029 | 16 | 19 22 51.69 | 2.1678 | 26 38 3.6 | 5.472 |
| 17 | 17 37 44.46 | 2.2822 | 28 29 46.6 | 0.884 | 17 | 19 25 1.64 | 2.1640 | 26 32 31.6 | 5.594 |
| 18 | 17 40 1.37 | 2.2814 | 28 30 35.3 | 0.740 | 18 | 19 27 11.37 | 2.1603 | 26 26 52.3 | 5.716 |
| 19 | 17 42 18.23 | 2.2805 | 28 31 15.4 | 0.597 | 19 | 19 29 20.88 | 2.1566 | 26 21 5.7 | 5.837 |
| 20 | 17 44 35.03 | 2.2795 | 28 31 47.0 | 0.455 | 20 | 19 31 30.16 | 2.1528 | 26 15 11.8 | 5.957 |
| 21 | 17 46 51.77 | 2.2785 | 28 32 10.0 | 0.312 | 21 | 19 33 39.21 | 2.1489 | 26 9 10.8 | 6.077 |
| 22 | 17 49 8.45 | 2.2774 | 28 32 24.4 | 0.168 | 22 | 19 35 48.03 | 2.1451 | 26 3 2.6 | 6.196 |
| 23 | 17 51 25.06 | 2.2762 | S.28 32 30.2 | −0.025 | 23 | 19 37 56.62 | 2.1412 | S.25 56 47.3 | 6.314 |
| | SUNDAY 22. | | | | | TUESDAY 24. | | | |
| 0 | 17 53 41.59 | 2.2748 | S.28 32 27.4 | +0.117 | 0 | 19 40 4.98 | 2.1374 | S.25 50 24.9 | 6.432 |
| 1 | 17 55 58.04 | 2.2734 | 28 32 16.1 | 0.259 | 1 | 19 42 13.11 | 2.1335 | 25 43 55.5 | 6.549 |
| 2 | 17 58 14.40 | 2.2720 | 28 31 56.2 | 0.401 | 2 | 19 44 21.00 | 2.1296 | 25 37 19.0 | 6.666 |
| 3 | 18 0 30.68 | 2.2705 | 28 31 28.0 | 0.542 | 3 | 19 46 28.66 | 2.1257 | 25 30 35.6 | 6.781 |
| 4 | 18 2 46.86 | 2.2689 | 28 30 51.2 | 0.683 | 4 | 19 48 36.08 | 2.1217 | 25 23 45.3 | 6.896 |
| 5 | 18 5 2.94 | 2.2672 | 28 30 6.0 | 0.824 | 5 | 19 50 43.27 | 2.1178 | 25 16 48.1 | 7.010 |
| 6 | 18 7 18.92 | 2.2654 | 28 29 12.3 | 0.965 | 6 | 19 52 50.22 | 2.1138 | 25 9 44.1 | 7.123 |
| 7 | 18 9 34.79 | 2.2636 | 28 28 10.2 | 1.105 | 7 | 19 54 56.93 | 2.1098 | 25 2 33.3 | 7.236 |
| 8 | 18 11 50.55 | 2.2617 | 28 26 59.7 | 1.246 | 8 | 19 57 3.40 | 2.1058 | 24 55 15.8 | 7.348 |
| 9 | 18 14 6.19 | 2.2597 | 28 25 40.7 | 1.386 | 9 | 19 59 9.63 | 2.1019 | 24 47 51.6 | 7.459 |
| 10 | 18 16 21.71 | 2.2576 | 28 24 13.4 | 1.524 | 10 | 20 1 15.63 | 2.0980 | 24 40 20.7 | 7.570 |
| 11 | 18 18 37.10 | 2.2554 | 28 22 37.8 | 1.662 | 11 | 20 3 21.39 | 2.0940 | 24 32 43.2 | 7.680 |
| 12 | 18 20 52.36 | 2.2532 | 28 20 53.9 | 1.801 | 12 | 20 5 26.91 | 2.0900 | 24 24 59.1 | 7.789 |
| 13 | 18 23 7.49 | 2.2510 | 28 19 1.7 | 1.939 | 13 | 20 7 32.19 | 2.0860 | 24 17 8.5 | 7.897 |
| 14 | 18 25 22.48 | 2.2486 | 28 17 1.2 | 2.077 | 14 | 20 9 37.23 | 2.0820 | 24 9 11.4 | 8.005 |
| 15 | 18 27 37.32 | 2.2462 | 28 14 52.4 | 2.215 | 15 | 20 11 42.03 | 2.0780 | 24 1 7.9 | 8.112 |
| 16 | 18 29 52.02 | 2.2437 | 28 12 35.4 | 2.351 | 16 | 20 13 46.59 | 2.0740 | 23 52 58.0 | 8.218 |
| 17 | 18 32 6.57 | 2.2412 | 28 10 10.3 | 2.487 | 17 | 20 15 50.91 | 2.0700 | 23 44 41.7 | 8.324 |
| 18 | 18 34 20.97 | 2.2386 | 28 7 37.0 | 2.622 | 18 | 20 17 54.99 | 2.0660 | 23 36 19.1 | 8.428 |
| 19 | 18 36 35.21 | 2.2359 | 28 4 55.6 | 2.757 | 19 | 20 19 58.83 | 2.0621 | 23 27 50.3 | 8.532 |
| 20 | 18 38 49.28 | 2.2332 | 28 2 6.1 | 2.892 | 20 | 20 22 2.44 | 2.0582 | 23 19 15.2 | 8.636 |
| 21 | 18 41 3.19 | 2.2304 | 27 59 8.5 | 3.027 | 21 | 20 24 5.81 | 2.0542 | 23 10 33.9 | 8.739 |
| 22 | 18 43 16.93 | 2.2275 | 27 56 2.8 | 3.162 | 22 | 20 26 8.94 | 2.0503 | 23 1 46.5 | 8.841 |
| 23 | 18 45 30.49 | 2.2246 | 27 52 49.1 | 3.295 | 23 | 20 28 11.84 | 2.0461 | 22 52 53.0 | 8.942 |
| 24 | 18 47 43.88 | 2.2217 | S.27 49 27.4 | 3.427 | 24 | 20 30 14.51 | 2.0425 | S.22 43 53.5 | 9.042 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | WEDNESDAY 25. | | | | | FRIDAY 27. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 20 30 14.51 | 2.0425 | S. 22 43 53.5 | 9.042 | 0 | 22 4 21.55 | 1.8951 | S. 13 48 2.7 | 13.008 |
| 1 | 20 32 16.94 | 2.0386 | 22 34 48.0 | 9.142 | 1 | 22 6 15.20 | 1.8932 | 13 35 0.3 | 13.073 |
| 2 | 20 34 19.14 | 2.0347 | 22 25 36.5 | 9.241 | 2 | 22 8 8.74 | 1.8914 | 13 21 54.0 | 13.138 |
| 3 | 20 36 21.11 | 2.0309 | 22 16 19.1 | 9.338 | 3 | 22 10 2.17 | 1.8897 | 13 8 43.8 | 13.202 |
| 4 | 20 38 22.85 | 2.0271 | 22 6 55.9 | 9.436 | 4 | 22 11 55.50 | 1.8880 | 12 55 29.8 | 13.264 |
| 5 | 20 40 24.36 | 2.0233 | 21 57 26.8 | 9.533 | 5 | 22 13 48.73 | 1.8863 | 12 42 12.1 | 13.325 |
| 6 | 20 42 25.64 | 2.0195 | 21 47 51.9 | 9.629 | 6 | 22 15 41.86 | 1.8847 | 12 28 50.8 | 13.386 |
| 7 | 20 44 26.70 | 2.0157 | 21 38 11.3 | 9.724 | 7 | 22 17 34.90 | 1.8832 | 12 15 25.8 | 13.447 |
| 8 | 20 46 27.53 | 2.0120 | 21 28 25.0 | 9.819 | 8 | 22 19 27.85 | 1.8818 | 12 1 57.1 | 13.508 |
| 9 | 20 48 28.14 | 2.0083 | 21 18 33.0 | 9.913 | 9 | 22 21 20.72 | 1.8806 | 11 48 24.8 | 13.567 |
| 10 | 20 50 28.53 | 2.0047 | 21 8 35.4 | 10.006 | 10 | 22 23 13.51 | 1.8792 | 11 34 49.0 | 13.626 |
| 11 | 20 52 28.70 | 2.0011 | 20 58 32.3 | 10.098 | 11 | 22 25 6.22 | 1.8779 | 11 21 9.7 | 13.683 |
| 12 | 20 54 28.66 | 1.9975 | 20 48 23.7 | 10.189 | 12 | 22 26 58.85 | 1.8767 | 11 7 27.0 | 13.740 |
| 13 | 20 56 28.40 | 1.9938 | 20 38 9.6 | 10.281 | 13 | 22 28 51.42 | 1.8756 | 10 53 40.9 | 13.797 |
| 14 | 20 58 27.92 | 1.9902 | 20 27 50.0 | 10.371 | 14 | 22 30 43.92 | 1.8745 | 10 39 51.4 | 13.852 |
| 15 | 21 0 27.23 | 1.9867 | 20 17 25.1 | 10.460 | 15 | 22 32 36.36 | 1.8735 | 10 25 58.6 | 13.907 |
| 16 | 21 2 26.33 | 1.9832 | 20 6 54.8 | 10.549 | 16 | 22 34 28.74 | 1.8726 | 10 12 2.6 | 13.961 |
| 17 | 21 4 25.22 | 1.9798 | 19 56 19.2 | 10.637 | 17 | 22 36 21.07 | 1.8718 | 9 58 3.3 | 14.014 |
| 18 | 21 6 23.91 | 1.9765 | 19 45 38.4 | 10.723 | 18 | 22 38 13.36 | 1.8711 | 9 44 0.9 | 14.066 |
| 19 | 21 8 22.40 | 1.9731 | 19 34 52.4 | 10.810 | 19 | 22 40 5.60 | 1.8704 | 9 29 55.4 | 14.117 |
| 20 | 21 10 20.68 | 1.9697 | 19 24 1.2 | 10.897 | 20 | 22 41 57.80 | 1.8697 | 9 15 46.8 | 14.169 |
| 21 | 21 12 18.76 | 1.9663 | 19 13 4.8 | 10.983 | 21 | 22 43 49.96 | 1.8691 | 9 1 35.1 | 14.220 |
| 22 | 21 14 16.64 | 1.9631 | 19 2 3.3 | 11.067 | 22 | 22 45 42.09 | 1.8686 | 8 47 20.4 | 14.269 |
| 23 | 21 16 14.33 | 1.9599 | S. 18 50 56.8 | 11.149 | 23 | 22 47 34.19 | 1.8682 | S. 8 33 2.8 | 14.317 |
| | THURSDAY 26. | | | | | SATURDAY 28. | | | |
| 0 | 21 18 11.83 | 1.9567 | S. 18 39 45.4 | 11.232 | 0 | 22 49 26.27 | 1.8678 | S. 8 18 42.3 | 14.365 |
| 1 | 21 20 9.14 | 1.9536 | 18 28 29.0 | 11.315 | 1 | 22 51 18.33 | 1.8675 | 8 4 19.0 | 14.412 |
| 2 | 21 22 6.26 | 1.9505 | 18 17 7.6 | 11.397 | 2 | 22 53 10.37 | 1.8673 | 7 49 52.9 | 14.458 |
| 3 | 21 24 3.20 | 1.9475 | 18 5 41.4 | 11.477 | 3 | 22 55 2.40 | 1.8672 | 7 35 24.0 | 14.505 |
| 4 | 21 25 59.96 | 1.9445 | 17 54 10.4 | 11.557 | 4 | 22 56 54.43 | 1.8672 | 7 20 52.3 | 14.550 |
| 5 | 21 27 56.54 | 1.9415 | 17 42 34.6 | 11.637 | 5 | 22 58 46.46 | 1.8672 | 7 6 18.0 | 14.593 |
| 6 | 21 29 52.94 | 1.9386 | 17 30 54.0 | 11.716 | 6 | 23 0 38.49 | 1.8672 | 6 51 41.1 | 14.636 |
| 7 | 21 31 49.17 | 1.9358 | 17 19 8.7 | 11.793 | 7 | 23 2 30.52 | 1.8673 | 6 37 1.7 | 14.677 |
| 8 | 21 33 45.23 | 1.9330 | 17 7 18.8 | 11.870 | 8 | 23 4 22.56 | 1.8675 | 6 22 19.8 | 14.719 |
| 9 | 21 35 41.13 | 1.9302 | 16 55 24.3 | 11.947 | 9 | 23 6 14.62 | 1.8679 | 6 7 35.4 | 14.761 |
| 10 | 21 37 36.86 | 1.9274 | 16 43 25.2 | 12.022 | 10 | 23 8 6.71 | 1.8683 | 5 52 48.5 | 14.801 |
| 11 | 21 39 32.42 | 1.9247 | 16 31 21.6 | 12.097 | 11 | 23 9 58.82 | 1.8687 | 5 37 59.3 | 14.839 |
| 12 | 21 41 27.82 | 1.9221 | 16 19 13.6 | 12.171 | 12 | 23 11 50.96 | 1.8692 | 5 23 7.8 | 14.877 |
| 13 | 21 43 23.07 | 1.9196 | 16 7 1.1 | 12.245 | 13 | 23 13 43.13 | 1.8698 | 5 8 14.1 | 14.914 |
| 14 | 21 45 18.17 | 1.9171 | 15 54 44.2 | 12.318 | 14 | 23 15 35.34 | 1.8705 | 4 53 18.1 | 14.952 |
| 15 | 21 47 13.12 | 1.9146 | 15 42 22.9 | 12.391 | 15 | 23 17 27.59 | 1.8713 | 4 38 19.9 | 14.988 |
| 16 | 21 49 7.92 | 1.9123 | 15 29 57.3 | 12.462 | 16 | 23 19 19.89 | 1.8721 | 4 23 19.6 | 15.022 |
| 17 | 21 51 2.59 | 1.9100 | 15 17 27.4 | 12.532 | 17 | 23 21 12.24 | 1.8730 | 4 8 17.3 | 15.055 |
| 18 | 21 52 57.12 | 1.9077 | 15 4 53.4 | 12.602 | 18 | 23 23 4.65 | 1.8740 | 3 53 13.0 | 15.088 |
| 19 | 21 54 51.51 | 1.9054 | 14 52 15.2 | 12.671 | 19 | 23 24 57.12 | 1.8751 | 3 38 6.7 | 15.121 |
| 20 | 21 56 45.77 | 1.9033 | 14 39 32.9 | 12.740 | 20 | 23 26 49.66 | 1.8762 | 3 22 58.5 | 15.152 |
| 21 | 21 58 39.90 | 1.9012 | 14 26 46.4 | 12.809 | 21 | 23 28 42.27 | 1.8774 | 3 7 48.5 | 15.182 |
| 22 | 22 0 33.91 | 1.8991 | 14 13 55.8 | 12.877 | 22 | 23 30 34.95 | 1.8787 | 2 52 36.7 | 15.211 |
| 23 | 22 2 27.79 | 1.8970 | 14 1 1.2 | 12.943 | 23 | 23 32 27.71 | 1.8801 | 2 37 23.2 | 15.239 |
| 24 | 22 4 21.55 | 1.8951 | S. 13 48 2.7 | 13.008 | 24 | 23 34 20.56 | 1.8816 | S. 2 22 8.0 | 15.267 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SUNDAY 29.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 23 34 20.56 | 1.8816 | S. 2 22 8.0 | 15.267 |
| 1 | 23 36 13.50 | 1.8832 | 2 6 51.2 | 15.293 |
| 2 | 23 38 6.54 | 1.8848 | 1 51 32.8 | 15.319 |
| 3 | 23 39 59.68 | 1.8865 | 1 36 12.9 | 15.344 |
| 4 | 23 41 52.92 | 1.8883 | 1 20 51.5 | 15.368 |
| 5 | 23 43 46.27 | 1.8901 | 1 5 28.7 | 15.391 |
| 6 | 23 45 39.73 | 1.8920 | 0 50 4.6 | 15.412 |
| 7 | 23 47 33.31 | 1.8941 | 0 34 39.2 | 15.433 |
| 8 | 23 49 27.02 | 1.8962 | 0 19 12.6 | 15.453 |
| 9 | 23 51 20.86 | 1.8984 | S. 0 3 44.8 | 15.472 |
| 10 | 23 53 14.83 | 1.9007 | N. 0 11 44.1 | 15.490 |
| 11 | 23 55 8.94 | 1.9030 | 0 27 14.0 | 15.506 |
| 12 | 23 57 3.19 | 1.9054 | 0 42 44.8 | 15.522 |
| 13 | 23 58 57.59 | 1.9080 | 0 58 16.6 | 15.537 |
| 14 | 0 0 52.15 | 1.9106 | 1 13 49.2 | 15.550 |
| 15 | 0 2 46.87 | 1.9133 | 1 29 22.6 | 15.562 |
| 16 | 0 4 41.75 | 1.9161 | 1 44 56.7 | 15.574 |
| 17 | 0 6 36.80 | 1.9189 | 2 0 31.5 | 15.585 |
| 18 | 0 8 32.02 | 1.9218 | 2 16 6.9 | 15.594 |
| 19 | 0 10 27.42 | 1.9248 | 2 31 42.8 | 15.602 |
| 20 | 0 12 23.00 | 1.9279 | 2 47 19.1 | 15.608 |
| 21 | 0 14 18.77 | 1.9312 | 3 2 55.8 | 15.614 |
| 22 | 0 16 14.74 | 1.9345 | 3 18 32.8 | 15.619 |
| 23 | 0 18 10.91 | 1.9378 | N. 3 34 10.1 | 15.623 |

### MONDAY 30.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 0 20 7.28 | 1.9412 | N. 3 49 47.6 | 15.626 |
| 1 | 0 22 3.86 | 1.9447 | 4 5 25.2 | 15.627 |
| 2 | 0 24 0.65 | 1.9483 | 4 21 2.8 | 15.626 |
| 3 | 0 25 57.66 | 1.9521 | 4 36 40.3 | 15.624 |
| 4 | 0 27 54.90 | 1.9560 | 4 52 17.7 | 15.622 |
| 5 | 0 29 52.38 | 1.9599 | 5 7 55.0 | 15.620 |
| 6 | 0 31 50.09 | 1.9638 | 5 23 32.1 | 15.615 |
| 7 | 0 33 48.04 | 1.9678 | 5 39 8.8 | 15.608 |
| 8 | 0 35 46.23 | 1.9718 | 5 54 45.1 | 15.601 |
| 9 | 0 37 44.66 | 1.9760 | 6 10 20.9 | 15.592 |
| 10 | 0 39 43.35 | 1.9804 | 6 25 56.2 | 15.582 |
| 11 | 0 41 42.31 | 1.9849 | 6 41 30.8 | 15.570 |
| 12 | 0 43 41.54 | 1.9894 | 6 57 4.6 | 15.557 |
| 13 | 0 45 41.04 | 1.9939 | 7 12 37.6 | 15.543 |
| 14 | 0 47 40.81 | 1.9985 | 7 28 9.8 | 15.528 |
| 15 | 0 49 40.86 | 2.0032 | 7 43 41.0 | 15.512 |
| 16 | 0 51 41.19 | 2.0079 | 7 59 11.2 | 15.493 |
| 17 | 0 53 41.81 | 2.0123 | 8 14 40.2 | 15.473 |
| 18 | 0 55 42.73 | 2.0178 | 8 30 8.0 | 15.452 |
| 19 | 0 57 43.95 | 2.0229 | 8 45 34.5 | 15.430 |
| 20 | 0 59 45.48 | 2.0281 | 9 0 59.6 | 15.406 |
| 21 | 1 1 47.32 | 2.0333 | 9 16 23.2 | 15.381 |
| 22 | 1 3 49.47 | 2.0385 | 9 31 45.3 | 15.354 |
| 23 | 1 5 51.94 | 2.0439 | 9 47 5.7 | 15.325 |
| 24 | 1 7 54.74 | 2.0494 | N.10 2 24.3 | 15.295 |

### TUESDAY 31.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 1 7 54.74 | 2.0494 | N.10 2 24.3 | 15.295 |
| 1 | 1 9 57.87 | 2.0550 | 10 17 41.1 | 15.264 |
| 2 | 1 12 1.34 | 2.0607 | 10 32 56.0 | 15.232 |
| 3 | 1 14 5.15 | 2.0663 | 10 48 8.9 | 15.198 |
| 4 | 1 16 9.30 | 2.0721 | 11 3 19.7 | 15.162 |
| 5 | 1 18 13.80 | 2.0779 | 11 18 28.3 | 15.123 |
| 6 | 1 20 18.65 | 2.0838 | 11 33 34.5 | 15.083 |
| 7 | 1 22 23.86 | 2.0899 | 11 48 38.3 | 15.043 |
| 8 | 1 24 29.44 | 2.0961 | 12 3 39.7 | 15.002 |
| 9 | 1 26 35.39 | 2.1022 | 12 18 38.5 | 14.958 |
| 10 | 1 28 41.71 | 2.1084 | 12 33 34.6 | 14.912 |
| 11 | 1 30 48.40 | 2.1148 | 12 48 27.9 | 14.864 |
| 12 | 1 32 55.48 | 2.1213 | 13 3 18.3 | 14.815 |
| 13 | 1 35 2.95 | 2.1278 | 13 18 5.7 | 14.764 |
| 14 | 1 37 10.81 | 2.1343 | 13 32 50.0 | 14.712 |
| 15 | 1 39 19.06 | 2.1408 | 13 47 31.2 | 14.658 |
| 16 | 1 41 27.70 | 2.1474 | 14 2 9.0 | 14.602 |
| 17 | 1 43 36.75 | 2.1542 | 14 16 43.4 | 14.544 |
| 18 | 1 45 46.21 | 2.1611 | 14 31 14.3 | 14.485 |
| 19 | 1 47 56.08 | 2.1680 | 14 45 41.6 | 14.424 |
| 20 | 1 50 6.37 | 2.1750 | 15 0 5.2 | 14.361 |
| 21 | 1 52 17.08 | 2.1820 | 15 14 24.9 | 14.296 |
| 22 | 1 54 28.21 | 2.1891 | 15 28 40.7 | 14.229 |
| 23 | 1 56 39.77 | 2.1963 | N.15 42 52.4 | 14.161 |

### WEDNESDAY, NOVEMBER 1.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 1 58 51.76 | 2.2035 | N.15 57 0.0 | 14.091 |

### PHASES OF THE MOON.

| | d | h | m |
|---|---|---|---|
| ○ Full Moon, . . . | 2 | 22 | 56.2 |
| ☾ Last Quarter, . . | 9 | 22 | 19.9 |
| ● New Moon, . . | 16 | 21 | 57.2 |
| ☽ First Quarter, . . | 24 | 19 | 54.4 |

| | d | h |
|---|---|---|
| ☾ Perigee, . . . . . | 10 | 3.5 |
| ☾ Apogee, . . . . . | 23 | 21.7 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | |
| 1 | Antares | W. | 97 10 35 | 2757 | 98 45 59 | 2745 | 100 21 39 | 2733 | 101 57 35 | 2721 |
| | α Aquilæ | W. | 52 22 51 | 4144 | 53 32 10 | 4076 | 54 42 35 | 4012 | 55 54 3 | 3951 |
| | Saturn | W. | 13 0 37 | 2740 | 14 36 24 | 2728 | 16 12 27 | 2716 | 17 48 46 | 2703 |
| | α Arietis | E. | 51 28 17 | 2799 | 49 53 48 | 2789 | 48 19 6 | 2779 | 46 44 11 | 2769 |
| | Aldebaran | E. | 82 47 22 | 2833 | 81 13 37 | 2822 | 79 39 38 | 2811 | 78 5 24 | 2799 |
| 2 | α Aquilæ | W. | 62 5 25 | 3701 | 63 22 11 | 3660 | 64 39 41 | 3621 | 65 57 53 | 3584 |
| | Saturn | W. | 25 54 26 | 2643 | 27 32 22 | 2632 | 29 10 34 | 2620 | 30 49 2 | 2609 |
| | α Arietis | E. | 38 46 34 | 2727 | 37 10 30 | 2721 | 35 34 18 | 2715 | 33 57 58 | 2711 |
| | Aldebaran | E. | 70 10 37 | 2746 | 68 34 58 | 2736 | 66 59 6 | 2727 | 65 23 2 | 2717 |
| | Pollux | E. | 113 11 1 | 2664 | 111 33 33 | 2652 | 109 55 49 | 2640 | 108 17 49 | 2629 |
| 3 | α Aquilæ | W. | 72 38 10 | 3431 | 73 59 51 | 3406 | 75 22 1 | 3383 | 76 44 37 | 3361 |
| | Fomalhaut | W. | 44 34 18 | 3106 | 46 2 20 | 3067 | 47 31 10 | 3030 | 49 0 46 | 2996 |
| | Saturn | W. | 39 5 13 | 2553 | 40 45 13 | 2542 | 42 25 28 | 2532 | 44 5 57 | 2521 |
| | Aldebaran | E. | 57 19 45 | 2678 | 55 42 35 | 2671 | 54 5 16 | 2665 | 52 27 49 | 2660 |
| | Pollux | E. | 100 3 53 | 2572 | 98 24 20 | 2561 | 96 44 32 | 2551 | 95 4 30 | 2540 |
| 4 | α Aquilæ | W. | 83 43 20 | 3274 | 85 8 2 | 3261 | 86 32 59 | 3249 | 87 58 10 | 3238 |
| | Fomalhaut | W. | 56 38 31 | 2857 | 58 11 45 | 2835 | 59 45 27 | 2814 | 61 19 37 | 2795 |
| | Saturn | W. | 52 31 53 | 2473 | 54 13 44 | 2464 | 55 55 48 | 2455 | 57 38 4 | 2446 |
| | α Pegasi | W. | 35 56 45 | 3270 | 37 21 32 | 3202 | 38 47 39 | 3142 | 40 14 58 | 3087 |
| | Aldebaran | E. | 44 19 20 | 2649 | 42 41 32 | 2651 | 41 3 46 | 2654 | 39 26 4 | 2660 |
| | Pollux | E. | 86 40 48 | 2492 | 84 59 23 | 2483 | 83 17 46 | 2474 | 81 35 56 | 2465 |
| 5 | α Aquilæ | W. | 95 6 37 | 3208 | 96 32 37 | 3206 | 97 58 39 | 3207 | 99 24 40 | 3208 |
| | Fomalhaut | W. | 69 16 20 | 2713 | 70 52 42 | 2700 | 72 29 22 | 2688 | 74 6 18 | 2677 |
| | Saturn | W. | 66 12 21 | 2408 | 67 55 45 | 2401 | 69 39 19 | 2394 | 71 23 3 | 2387 |
| | α Pegasi | W. | 47 46 15 | 2884 | 49 18 54 | 2854 | 50 52 12 | 2825 | 52 26 7 | 2800 |
| | Pollux | E. | 73 3 51 | 2426 | 71 20 53 | 2419 | 69 37 45 | 2412 | 67 54 28 | 2405 |
| | Venus | E. | 108 45 32 | 2772 | 107 10 27 | 2764 | 105 35 12 | 2756 | 103 59 47 | 2749 |
| | Regulus | E. | 109 53 55 | 2424 | 108 10 55 | 2417 | 106 27 44 | 2410 | 104 44 23 | 2403 |
| 6 | Fomalhaut | W. | 82 14 27 | 2631 | 83 52 40 | 2624 | 85 31 2 | 2618 | 87 9 33 | 2612 |
| | Saturn | W. | 80 4 0 | 2357 | 81 48 36 | 2352 | 83 33 20 | 2347 | 85 18 11 | 2342 |
| | α Pegasi | W. | 60 23 13 | 2699 | 61 59 54 | 2684 | 63 36 56 | 2669 | 65 14 17 | 2655 |
| | Pollux | E. | 59 15 46 | 2376 | 57 31 37 | 2371 | 55 47 21 | 2366 | 54 2 58 | 2362 |
| | Venus | E. | 96 0 23 | 2716 | 94 24 5 | 2711 | 92 47 40 | 2705 | 91 11 7 | 2701 |
| | Regulus | E. | 96 5 22 | 2373 | 94 21 8 | 2368 | 92 36 47 | 2363 | 90 52 19 | 2357 |
| 7 | Fomalhaut | W. | 95 23 43 | 2594 | 97 2 46 | 2593 | 98 41 51 | 2592 | 100 20 57 | 2591 |
| | Saturn | W. | 94 4 4 | 2322 | 95 49 32 | 2318 | 97 35 5 | 2315 | 99 20 43 | 2312 |
| | α Pegasi | W. | 73 25 10 | 2604 | 75 4 0 | 2596 | 76 43 1 | 2588 | 78 22 13 | 2581 |
| | α Arietis | W. | 30 8 39 | 2432 | 31 51 28 | 2419 | 33 34 35 | 2408 | 35 17 58 | 2398 |
| | Pollux | E. | 45 19 28 | 2342 | 43 34 30 | 2339 | 41 49 27 | 2336 | 40 4 20 | 2334 |
| | Regulus | E. | 82 8 18 | 2337 | 80 23 12 | 2333 | 78 38 1 | 2330 | 76 52 45 | 2327 |
| | Venus | E. | 83 6 49 | 2678 | 81 29 40 | 2675 | 79 52 26 | 2671 | 78 15 7 | 2668 |
| | Sun | E. | 128 24 35 | 2657 | 126 46 57 | 2652 | 125 9 13 | 2649 | 123 31 24 | 2645 |
| 8 | Saturn | W. | 108 9 56 | 2298 | 109 55 58 | 2296 | 111 42 3 | 2294 | 113 28 11 | 2292 |
| | α Pegasi | W. | 86 40 5 | 2559 | 88 19 56 | 2556 | 89 59 51 | 2554 | 91 39 49 | 2553 |
| | α Arietis | W. | 43 57 56 | 2363 | 45 42 24 | 2357 | 47 27 0 | 2353 | 49 11 42 | 2348 |
| | Pollux | E. | 31 17 57 | 2324 | 29 32 33 | 2321 | 27 47 9 | 2324 | 26 1 44 | 2324 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Antares | W. | 103° 33′ 47″ | 2708 | 105° 10′ 16″ | 2696 | 106° 47′ 1″ | 2684 | 108° 24′ 2″ | 2672 |
| | α Aquilæ | W. | 57 6 31 | 3895 | 58 19 56 | 3842 | 59 34 15 | 3792 | 60 49 26 | 3746 |
| | Saturn | W. | 19 25 22 | 2691 | 21 2 14 | 2679 | 22 39 22 | 2667 | 24 16 46 | 2655 |
| | α Arietis | E. | 45 9 3 | 2760 | 43 33 43 | 2751 | 41 58 11 | 2743 | 40 22 28 | 2735 |
| | Aldebaran | E. | 76 30 55 | 2788 | 74 56 12 | 2777 | 73 21 14 | 2766 | 71 46 2 | 2756 |
| 2 | α Aquilæ | W. | 67 16 45 | 3549 | 68 36 15 | 3517 | 69 56 20 | 3487 | 71 16 59 | 3458 |
| | Saturn | W. | 32 27 45 | 2597 | 34 6 44 | 2586 | 35 45 58 | 2574 | 37 25 28 | 2564 |
| | α Arietis | E. | 32 21 33 | 2707 | 30 45 3 | 2705 | 29 8 30 | 2705 | 27 31 57 | 2708 |
| | Aldebaran | E. | 63 46 45 | 2708 | 62 10 16 | 2700 | 60 33 36 | 2692 | 58 56 45 | 2685 |
| | Pollux | E. | 106 39 33 | 2617 | 105 1 1 | 2606 | 103 22 14 | 2594 | 101 43 11 | 2583 |
| 3 | α Aquilæ | W. | 78 7 38 | 3340 | 79 31 3 | 3322 | 80 54 49 | 3305 | 82 18 55 | 3288 |
| | Fomalhaut | W. | 50 31 4 | 2964 | 52 2 2 | 2934 | 53 33 38 | 2907 | 55 5 48 | 2881 |
| | Saturn | W. | 45 46 41 | 2511 | 47 27 39 | 2502 | 49 8 50 | 2492 | 50 50 15 | 2482 |
| | Aldebaran | E. | 50 50 16 | 2656 | 49 12 37 | 2653 | 47 34 54 | 2651 | 45 57 8 | 2649 |
| | Pollux | E. | 93 24 13 | 2530 | 91 43 42 | 2521 | 90 2 58 | 2511 | 88 22 0 | 2501 |
| 4 | α Aquilæ | W. | 89 23 34 | 3230 | 90 49 8 | 3222 | 92 14 51 | 3216 | 93 40 41 | 3211 |
| | Fomalhaut | W. | 62 54 12 | 2776 | 64 29 11 | 2759 | 66 4 33 | 2743 | 67 40 16 | 2727 |
| | Saturn | W. | 59 20 33 | 2438 | 61 3 13 | 2430 | 62 46 5 | 2422 | 64 29 8 | 2415 |
| | α Pegasi | W. | 41 43 23 | 3039 | 43 12 48 | 2994 | 44 43 8 | 2954 | 46 14 18 | 2917 |
| | Aldebaran | E. | 37 48 30 | 2667 | 36 11 6 | 2676 | 34 33 54 | 2689 | 32 57 0 | 2706 |
| | Pollux | E. | 79 53 54 | 2457 | 78 11 40 | 2449 | 76 29 15 | 2441 | 74 46 39 | 2433 |
| 5 | α Aquilæ | W. | 100 50 40 | 3210 | 102 16 37 | 3215 | 103 42 28 | 3221 | 105 8 12 | 3230 |
| | Fomalhaut | W. | 75 43 29 | 2666 | 77 20 54 | 2656 | 78 58 33 | 2647 | 80 36 24 | 2638 |
| | Saturn | W. | 73 6 57 | 2380 | 74 51 0 | 2375 | 76 35 11 | 2368 | 78 19 31 | 2362 |
| | α Pegasi | W. | 54 0 35 | 2776 | 55 35 34 | 2755 | 57 11 1 | 2735 | 58 46 55 | 2716 |
| | Pollux | E. | 66 11 1 | 2399 | 64 27 25 | 2393 | 62 43 40 | 2387 | 60 59 47 | 2382 |
| | Venus | E. | 102 24 12 | 2742 | 100 48 28 | 2735 | 99 12 35 | 2729 | 97 36 33 | 2722 |
| | Regulus | E. | 103 0 53 | 2397 | 101 17 14 | 2391 | 99 33 26 | 2384 | 97 49 28 | 2378 |
| 6 | Fomalhaut | W. | 88 48 11 | 2607 | 90 26 56 | 2603 | 92 5 47 | 2599 | 93 44 43 | 2596 |
| | Saturn | W. | 87 3 9 | 2337 | 88 48 14 | 2333 | 90 33 25 | 2329 | 92 18 42 | 2326 |
| | α Pegasi | W. | 66 51 57 | 2643 | 68 29 53 | 2632 | 70 8 5 | 2621 | 71 46 31 | 2612 |
| | Pollux | E. | 52 18 28 | 2357 | 50 33 51 | 2353 | 48 49 9 | 2349 | 47 4 21 | 2346 |
| | Venus | E. | 89 34 28 | 2695 | 87 57 42 | 2691 | 86 20 50 | 2687 | 84 43 52 | 2683 |
| | Regulus | E. | 89 7 43 | 2353 | 87 23 1 | 2349 | 85 38 13 | 2345 | 83 53 19 | 2340 |
| 7 | Fomalhaut | W. | 102 0 4 | 2592 | 103 39 10 | 2593 | 105 18 14 | 2595 | 106 57 16 | 2598 |
| | Saturn | W. | 101 6 25 | 2309 | 102 52 12 | 2306 | 104 38 3 | 2303 | 106 23 58 | 2301 |
| | α Pegasi | W. | 80 1 34 | 2576 | 81 41 2 | 2571 | 83 20 37 | 2566 | 85 0 18 | 2562 |
| | α Arietis | W. | 37 1 35 | 2390 | 38 45 24 | 2382 | 40 29 25 | 2375 | 42 13 36 | 2368 |
| | Pollux | E. | 38 19 10 | 2331 | 36 33 56 | 2329 | 34 48 39 | 2327 | 33 3 19 | 2326 |
| | Regulus | E. | 75 7 25 | 2324 | 73 22 0 | 2321 | 71 36 31 | 2318 | 69 50 58 | 2316 |
| | Venus | E. | 76 37 44 | 2665 | 75 0 17 | 2661 | 73 22 45 | 2658 | 71 45 9 | 2656 |
| | Sun | E. | 121 53 30 | 2641 | 120 15 31 | 2639 | 118 37 29 | 2636 | 116 59 23 | 2633 |
| 8 | Saturn | W. | 115 14 22 | 2291 | 117 0 35 | 2289 | 118 46 51 | 2288 | 120 33 8 | 2287 |
| | α Pegasi | W. | 93 19 49 | 2552 | 94 59 50 | 2552 | 96 39 51 | 2552 | 98 19 52 | 2553 |
| | α Arietis | W. | 50 56 31 | 2345 | 52 41 25 | 2341 | 54 26 25 | 2338 | 56 11 29 | 2335 |
| | Pollux | E. | 24 16 19 | 2324 | 22 30 55 | 2327 | 20 45 35 | 2330 | 19 0 19 | 2334 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Regulus | E. | 68° 5′ 22″ | 2313 | 66° 19′ 42″ | 2311 | 64° 33′ 59″ | 2309 | 62° 48′ 13″ | 2307 |
| | Venus | E. | 70 7 30 | 2654 | 68 29 48 | 2652 | 66 52 3 | 2649 | 65 14 15 | 2647 |
| | Sun | E. | 115 21 13 | 2631 | 113 43 0 | 2628 | 112 4 43 | 2626 | 110 26 23 | 2624 |
| 9 | α Arietis | W. | 57 56 37 | 2333 | 59 41 49 | 2330 | 61 27 5 | 2328 | 63 12 23 | 2326 |
| | Aldebaran | W. | 28 10 52 | 2635 | 29 49 0 | 2600 | 31 27 55 | 2570 | 33 7 31 | 2545 |
| | Regulus | E. | 53 58 46 | 2300 | 52 12 47 | 2299 | 50 26 46 | 2298 | 48 40 44 | 2298 |
| | Venus | E. | 57 4 40 | 2640 | 55 26 40 | 2639 | 53 48 38 | 2638 | 52 10 35 | 2638 |
| | Sun | E. | 102 14 6 | 2616 | 100 35 33 | 2615 | 98 56 58 | 2614 | 97 18 22 | 2612 |
| 10 | α Arietis | W. | 71 59 29 | 2320 | 73 44 59 | 2320 | 75 30 30 | 2320 | 77 16 1 | 2319 |
| | Aldebaran | W. | 41 32 55 | 2460 | 43 15 4 | 2450 | 44 57 28 | 2441 | 46 40 5 | 2431 |
| | Regulus | E. | 39 50 24 | 2296 | 38 4 19 | 2296 | 36 18 14 | 2297 | 34 32 10 | 2297 |
| | Venus | E. | 44 0 9 | 2636 | 42 22 3 | 2636 | 40 43 57 | 2636 | 39 5 51 | 2637 |
| | Sun | E. | 89 5 6 | 2610 | 87 26 25 | 2611 | 85 47 45 | 2611 | 84 9 5 | 2611 |
| 11 | α Arietis | W. | 86 3 38 | 2320 | 87 49 8 | 2322 | 89 34 36 | 2322 | 91 30 3 | 2324 |
| | Aldebaran | W. | 55 15 41 | 2405 | 56 59 9 | 2401 | 58 42 42 | 2398 | 60 26 20 | 2396 |
| | Venus | E. | 30 55 37 | 2642 | 29 17 39 | 2643 | 27 39 42 | 2644 | 26 1 47 | 2647 |
| | Sun | E. | 75 55 53 | 2615 | 74 17 18 | 2615 | 72 38 44 | 2617 | 71 0 12 | 2619 |
| 12 | Aldebaran | W. | 69 5 2 | 2391 | 70 48 49 | 2392 | 72 32 35 | 2393 | 74 16 20 | 2394 |
| | Pollux | W. | 25 25 2 | 2324 | 27 10 27 | 2324 | 28 55 51 | 2325 | 30 41 14 | 2326 |
| | Sun | E. | 62 48 9 | 2629 | 61 9 53 | 2632 | 59 31 41 | 2634 | 57 53 32 | 2638 |
| 13 | Aldebaran | W. | 82 54 32 | 2405 | 84 38 0 | 2408 | 86 21 23 | 2412 | 88 4 40 | 2416 |
| | Pollux | W. | 39 27 34 | 2337 | 41 12 39 | 2341 | 42 57 39 | 2344 | 44 42 34 | 2348 |
| | Sun | E. | 49 44 0 | 2657 | 48 6 22 | 2661 | 46 28 50 | 2666 | 44 51 25 | 2672 |
| 14 | Aldebaran | W. | 96 39 30 | 2442 | 98 22 5 | 2448 | 100 4 31 | 2455 | 101 46 47 | 2462 |
| | Pollux | W. | 53 25 38 | 2371 | 55 9 54 | 2377 | 56 54 2 | 2382 | 58 38 2 | 2389 |
| | Sun | E. | 36 46 14 | 2703 | 35 9 38 | 2711 | 33 33 13 | 2719 | 31 56 58 | 2727 |
| 19 | Sun | W. | 25 27 40 | 3152 | 26 54 47 | 3163 | 28 21 41 | 3174 | 29 48 21 | 3185 |
| | α Aquilæ | E. | 73 46 22 | 3627 | 72 28 17 | 3655 | 71 10 42 | 3684 | 69 53 38 | 3714 |
| | Fomalhaut | E. | 98 10 56 | 3029 | 96 41 19 | 3040 | 95 11 56 | 3051 | 93 42 46 | 3063 |
| | Saturn | E. | 99 53 27 | 2759 | 98 18 5 | 2771 | 96 42 59 | 2784 | 95 8 10 | 2795 |
| 20 | Sun | W. | 36 58 16 | 3243 | 38 23 34 | 3255 | 39 48 38 | 3266 | 41 13 29 | 3278 |
| | α Aquilæ | E. | 63 36 50 | 3892 | 62 23 22 | 3932 | 61 10 35 | 3976 | 59 58 32 | 4022 |
| | Fomalhaut | E. | 86 20 34 | 3123 | 84 52 52 | 3136 | 83 25 26 | 3149 | 81 58 16 | 3162 |
| | Saturn | E. | 87 17 59 | 2855 | 85 44 43 | 2867 | 84 11 42 | 2878 | 82 38 55 | 2890 |
| | α Pegasi | E. | 108 16 44 | 3137 | 106 49 19 | 3143 | 105 22 2 | 3151 | 103 54 54 | 3158 |
| 21 | Sun | W. | 48 14 27 | 3332 | 49 38 2 | 3342 | 51 1 25 | 3351 | 52 24 37 | 3361 |
| | α Aquilæ | E. | 54 10 18 | 4294 | 53 3 20 | 4359 | 51 57 22 | 4429 | 50 52 27 | 4502 |
| | Fomalhaut | E. | 74 46 22 | 3230 | 73 20 48 | 3244 | 71 55 31 | 3258 | 70 30 30 | 3272 |
| | Saturn | E. | 74 58 31 | 2942 | 73 27 6 | 2951 | 71 55 52 | 2961 | 70 24 50 | 2969 |
| | α Pegasi | E. | 96 41 34 | 3198 | 95 15 23 | 3207 | 93 49 22 | 3215 | 92 23 31 | 3224 |
| 22 | Sun | W. | 59 18 1 | 3403 | 60 40 14 | 3410 | 62 2 19 | 3417 | 63 24 16 | 3424 |
| | Jupiter | W. | 25 43 44 | 3196 | 27 9 58 | 3193 | 28 36 15 | 3192 | 30 2 34 | 3190 |
| | Antares | W. | 20 30 14 | 3018 | 22 0 4 | 3025 | 23 29 46 | 3031 | 24 59 20 | 3038 |

## GREENWICH MEAN TIME.

### LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Regulus | E. | 61° 2′ 24″ | 2306 | 59° 16′ 33″ | 2304 | 57° 30′ 39″ | 2302 | 55° 44′ 43″ | 2302 |
| | Venus | E. | 63 36 24 | 2646 | 61 58 31 | 2644 | 60 20 36 | 2643 | 58 42 39 | 2641 |
| | Sun | E. | 108 48 0 | 2622 | 107 9 35 | 2620 | 105 31 7 | 2618 | 103 52 37 | 2618 |
| 9 | α Arietis | W. | 64 57 44 | 2324 | 66 43 8 | 2324 | 68 28 33 | 2322 | 70 14 0 | 2321 |
| | Aldebaran | W. | 34 47 42 | 2522 | 36 28 24 | 2504 | 38 9 32 | 2487 | 39 51 3 | 2472 |
| | Regulus | E. | 46 54 42 | 2298 | 45 8 39 | 2296 | 43 22 34 | 2296 | 41 36 29 | 2296 |
| | Venus | E. | 50 32 31 | 2637 | 48 54 26 | 2637 | 47 16 21 | 2636 | 45 38 15 | 2636 |
| | Sun | E. | 95 39 44 | 2612 | 94 1 5 | 2612 | 92 22 26 | 2611 | 90 43 46 | 2611 |
| 10 | α Arietis | W. | 79 1 33 | 2319 | 80 47 5 | 2320 | 82 32 36 | 2320 | 84 18 7 | 2320 |
| | Aldebaran | W. | 48 22 55 | 2424 | 50 5 55 | 2419 | 51 49 3 | 2413 | 53 32 19 | 2409 |
| | Regulus | E. | 32 46 6 | 2298 | 31 0 3 | 2299 | 29 14 2 | 2300 | 27 28 3 | 2302 |
| | Venus | E. | 37 27 46 | 2638 | 35 49 42 | 2638 | 34 11 39 | 2639 | 32 33 37 | 2640 |
| | Sun | E. | 82 30 25 | 2612 | 80 51 46 | 2612 | 79 13 7 | 2612 | 77 34 29 | 2614 |
| 11 | α Arietis | W. | 93 5 28 | 2325 | 94 50 51 | 2327 | 96 36 11 | 2328 | 98 21 29 | 2331 |
| | Aldebaran | W. | 62 10 1 | 2394 | 63 53 44 | 2393 | 65 37 29 | 2392 | 67 21 15 | 2391 |
| | Venus | E. | 24 23 56 | 2649 | 22 46 8 | 2652 | 21 8 23 | 2655 | 19 30 42 | 2657 |
| | Sun | E. | 69 21 43 | 2621 | 67 43 16 | 2622 | 66 4 51 | 2624 | 64 26 29 | 2626 |
| 12 | Aldebaran | W. | 76 0 4 | 2396 | 77 43 45 | 2297 | 79 27 24 | 2399 | 81 11 0 | 2402 |
| | Pollux | W. | 32 26 36 | 2328 | 34 11 55 | 2329 | 35 57 12 | 2332 | 37 42 25 | 2335 |
| | Sun | E. | 56 15 28 | 2641 | 54 37 29 | 2644 | 52 59 34 | 2648 | 51 21 44 | 2652 |
| 13 | Aldebaran | W. | 89 47 52 | 2421 | 91 30 57 | 2425 | 93 13 56 | 2431 | 94 56 47 | 2436 |
| | Pollux | W. | 46 27 24 | 2353 | 48 12 7 | 2357 | 49 56 44 | 2361 | 51 41 15 | 2366 |
| | Sun | E. | 43 14 7 | 2678 | 41 36 57 | 2683 | 39 59 54 | 2689 | 38 22 59 | 2696 |
| 14 | Aldebaran | W. | 103 28 53 | 2470 | 105 10 49 | 2478 | 106 52 33 | 2487 | 108 34 5 | 2495 |
| | Pollux | W. | 60 21 53 | 2395 | 62 5 35 | 2402 | 63 49 7 | 2409 | 65 32 29 | 2415 |
| | Sun | E. | 30 20 54 | 2737 | 28 45 3 | 2747 | 27 9 25 | 2757 | 25 34 1 | 2769 |
| 19 | Sun | W. | 31 14 48 | 3197 | 32 41 1 | 3209 | 34 7 0 | 3220 | 35 32 45 | 3232 |
| | α Aquilæ | E. | 68 37 6 | 3746 | 67 21 8 | 3780 | 66 5 45 | 3815 | 64 50 58 | 3853 |
| | Fomalhaut | E. | 92 13 51 | 3074 | 90 45 10 | 3086 | 89 16 43 | 3098 | 87 48 31 | 3110 |
| | Saturn | E. | 93 33 36 | 2808 | 91 59 18 | 2820 | 90 25 16 | 2832 | 88 51 30 | 2844 |
| 20 | Sun | W. | 42 38 6 | 3289 | 44 2 30 | 3300 | 45 26 41 | 3311 | 46 50 40 | 3321 |
| | α Aquilæ | E. | 58 47 14 | 4070 | 57 36 43 | 4121 | 56 27 2 | 4176 | 55 18 13 | 4233 |
| | Fomalhaut | E. | 80 31 21 | 3175 | 79 4 42 | 3188 | 77 38 19 | 3202 | 76 12 12 | 3216 |
| | Saturn | E. | 81 6 23 | 2901 | 79 34 5 | 2911 | 78 2 0 | 2922 | 76 30 9 | 2932 |
| | α Pegasi | E. | 102 27 55 | 3166 | 101 1 5 | 3174 | 99 34 25 | 3183 | 98 7 55 | 3190 |
| 21 | Sun | W. | 53 47 38 | 3370 | 55 10 29 | 3379 | 56 33 9 | 3388 | 57 55 39 | 3395 |
| | α Aquilæ | E. | 49 48 37 | 4582 | 48 45 57 | 4668 | 47 44 30 | 4759 | 46 44 20 | 4859 |
| | Fomalhaut | E. | 69 5 46 | 3287 | 67 41 19 | 3302 | 66 17 10 | 3318 | 64 53 19 | 3332 |
| | Saturn | E. | 68 53 59 | 2978 | 67 23 19 | 2986 | 65 52 49 | 2994 | 64 22 29 | 3002 |
| | α Pegasi | E. | 90 57 50 | 3232 | 89 32 19 | 3241 | 88 6 58 | 3248 | 86 41 46 | 3257 |
| 22 | Sun | W. | 64 46 5 | 3430 | 66 7 48 | 3436 | 67 29 24 | 3440 | 68 50 55 | 3446 |
| | Jupiter | W. | 31 28 55 | 3190 | 32 55 16 | 3190 | 34 21 37 | 3189 | 35 47 59 | 3189 |
| | Antares | W. | 26 28 46 | 3043 | 27 58 6 | 3048 | 29 27 19 | 3052 | 30 56 27 | 3057 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | Saturn | E. | 62° 52′ 19″ | 3009 | 61° 22′ 18″ | 3016 | 59° 52′ 25″ | 3022 | 58° 22′ 40″ | 3029 |
| | Fomalhaut | E. | 63 29 45 | 3348 | 62 6 29 | 3365 | 60 43 32 | 3381 | 59 20 54 | 3398 |
| | α Pegasi | E. | 85 16 44 | 3265 | 83 51 52 | 3273 | 82 27 9 | 3282 | 81 2 36 | 3289 |
| 23 | Sun | W. | 70 12 20 | 3450 | 71 33 40 | 3453 | 72 54 57 | 3456 | 74 16 10 | 3459 |
| | Jupiter | W. | 37 14 21 | 3189 | 38 40 43 | 3190 | 40 7 4 | 3190 | 41 33 25 | 3190 |
| | Antares | W. | 32 25 29 | 3060 | 33 54 27 | 3065 | 35 23 20 | 3067 | 36 52 10 | 3069 |
| | Saturn | E. | 50 55 39 | 3053 | 49 26 32 | 3056 | 47 57 29 | 3059 | 46 28 29 | 3062 |
| | Fomalhaut | E. | 52 32 45 | 3493 | 51 12 13 | 3515 | 49 52 6 | 3538 | 48 32 24 | 3563 |
| | α Pegasi | E. | 74 2 9 | 3329 | 72 38 31 | 3337 | 71 15 2 | 3345 | 69 51 42 | 3352 |
| 24 | Sun | W. | 81 1 42 | 3464 | 82 22 46 | 3464 | 83 43 50 | 3463 | 85 4 55 | 3462 |
| | Jupiter | W. | 48 45 17 | 3186 | 50 11 43 | 3184 | 51 38 11 | 3182 | 53 4 42 | 3179 |
| | Antares | W. | 44 15 47 | 3074 | 45 44 28 | 3073 | 47 13 10 | 3073 | 48 41 53 | 3071 |
| | Saturn | E. | 39 4 7 | 3067 | 37 35 17 | 3067 | 36 6 27 | 3066 | 34 37 36 | 3065 |
| | Fomalhaut | E. | 42 1 16 | 3716 | 40 44 46 | 3756 | 39 28 58 | 3799 | 38 13 55 | 3848 |
| | α Pegasi | E. | 62 57 16 | 3393 | 61 34 51 | 3400 | 60 12 35 | 3409 | 58 50 29 | 3419 |
| | α Arietis | E. | 104 1 35 | 3101 | 102 33 26 | 3100 | 101 5 16 | 3099 | 99 37 5 | 3096 |
| 25 | Sun | W. | 91 50 58 | 3446 | 93 12 22 | 3441 | 94 33 52 | 3437 | 95 55 27 | 3431 |
| | Jupiter | W. | 60 18 15 | 3159 | 61 45 13 | 3154 | 63 12 17 | 3149 | 64 39 27 | 3143 |
| | Antares | W. | 56 6 7 | 3056 | 57 35 10 | 3052 | 59 4 18 | 3047 | 60 33 32 | 3042 |
| | Saturn | E. | 27 12 43 | 3051 | 25 43 33 | 3047 | 24 14 18 | 3041 | 22 44 56 | 3036 |
| | α Pegasi | E. | 52 2 50 | 3474 | 50 41 57 | 3488 | 49 21 20 | 3503 | 48 0 59 | 3519 |
| | α Arietis | E. | 92 15 26 | 3082 | 90 46 54 | 3077 | 89 18 16 | 3073 | 87 49 33 | 3067 |
| 26 | Sun | W. | 102 45 13 | 3394 | 104 7 36 | 3386 | 105 30 9 | 3377 | 106 52 52 | 3367 |
| | Jupiter | W. | 71 57 19 | 3106 | 73 25 21 | 3097 | 74 53 34 | 3088 | 76 21 58 | 3079 |
| | Antares | W. | 68 1 34 | 3008 | 69 31 37 | 3000 | 71 1 50 | 2991 | 72 32 14 | 2982 |
| | α Arietis | E. | 80 24 7 | 3034 | 78 54 36 | 3026 | 77 24 55 | 3018 | 75 55 5 | 3009 |
| | Aldebaran | E. | 111 26 56 | 3093 | 109 58 38 | 3082 | 108 30 7 | 3073 | 107 1 24 | 3062 |
| 27 | Sun | W. | 113 49 24 | 3313 | 115 13 21 | 3300 | 116 37 32 | 3288 | 118 1 58 | 3276 |
| | Jupiter | W. | 83 47 0 | 3026 | 85 16 41 | 3014 | 86 46 36 | 3002 | 88 16 46 | 2990 |
| | Antares | W. | 80 7 14 | 2931 | 81 38 54 | 2920 | 83 10 48 | 2907 | 84 42 58 | 2895 |
| | α Arietis | E. | 68 22 59 | 2960 | 66 51 56 | 2949 | 65 20 39 | 2939 | 63 49 9 | 2927 |
| | Aldebaran | E. | 99 34 30 | 3006 | 98 4 25 | 2994 | 96 34 5 | 2982 | 95 3 30 | 2969 |
| 28 | Sun | W. | 125 7 57 | 3207 | 126 33 58 | 3193 | 128 0 16 | 3178 | 129 26 52 | 3163 |
| | Antares | W. | 92 27 47 | 2830 | 94 1 36 | 2816 | 95 35 43 | 2802 | 97 10 8 | 2788 |
| | α Aquilæ | W. | 48 59 22 | 4407 | 50 4 37 | 4321 | 51 11 10 | 4241 | 52 18 57 | 4166 |
| | α Arietis | E. | 56 7 56 | 2867 | 54 34 55 | 2855 | 53 1 39 | 2843 | 51 28 7 | 2830 |
| | Aldebaran | E. | 87 26 32 | 2904 | 85 54 18 | 2891 | 84 21 47 | 2877 | 82 48 58 | 2862 |
| 29 | α Aquilæ | W. | 58 14 41 | 3851 | 59 28 51 | 3798 | 60 43 55 | 3747 | 61 59 52 | 3701 |
| | α Arietis | E. | 43 36 21 | 2769 | 42 1 12 | 2757 | 40 25 48 | 2746 | 38 50 9 | 2735 |
| | Aldebaran | E. | 75 0 24 | 2793 | 73 25 47 | 2779 | 71 50 52 | 2765 | 70 15 38 | 2752 |
| 30 | α Aquilæ | W. | 68 31 23 | 3497 | 69 51 50 | 3463 | 71 12 55 | 3431 | 72 34 37 | 3399 |
| | Aldebaran | E. | 62 15 4 | 2686 | 60 38 5 | 2674 | 59 0 50 | 2662 | 57 23 19 | 2650 |
| 31 | α Aquilæ | W. | 79 31 25 | 3267 | 80 56 15 | 3246 | 82 21 30 | 3225 | 83 47 10 | 3206 |
| | Aldebaran | E. | 49 12 8 | 2604 | 47 33 18 | 2596 | 45 54 18 | 2591 | 44 15 11 | 2567 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | $\mathrm{XV}^{h}$. | P. L of Diff. | $\mathrm{XVIII}^{h}$. | P. L. of Diff. | $\mathrm{XXI}^{h}$. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | Saturn | E. | 56° 53′ 3″ | 3034 | 55° 23′ 33″ | 3039 | 53° 54′ 9″ | 3044 | 52° 24′ 51″ | 3049 |
| | Fomalhaut | E. | 57 58 35 | 3415 | 56 36 36 | 3433 | 55 14 57 | 3453 | 53 53 40 | 3472 |
| | α Pegasi | E. | 79 38 12 | 3297 | 78 13 57 | 3306 | 76 49 52 | 3313 | 75 25 56 | 3321 |
| 23 | Sun | W. | 75 37 20 | 3461 | 76 58 28 | 3463 | 78 19 34 | 3464 | 79 40 38 | 3464 |
| | Jupiter | W. | 42 59 46 | 3189 | 44 26 8 | 3189 | 45 52 30 | 3188 | 47 18 53 | 3188 |
| | Antares | W. | 38 20 57 | 3072 | 39 49 41 | 3073 | 41 18 24 | 3073 | 42 47 6 | 3074 |
| | Saturn | E. | 44 59 33 | 3064 | 43 30 39 | 3065 | 42 1 47 | 3067 | 40 32 57 | 3067 |
| | Fomalhaut | E. | 47 13 9 | 3589 | 45 54 23 | 3617 | 44 36 7 | 3646 | 43 18 24 | 3680 |
| | α Pegasi | E. | 68 28 31 | 3359 | 67 5 28 | 3368 | 65 42 35 | 3376 | 64 19 51 | 3384 |
| 24 | Sun | W. | 86 26 2 | 3460 | 87 47 11 | 3457 | 89 8 23 | 3454 | 90 29 38 | 3450 |
| | Jupiter | W. | 54 31 16 | 3176 | 55 57 54 | 3173 | 57 24 36 | 3168 | 58 51 23 | 3164 |
| | Antares | W. | 50 10 38 | 3069 | 51 39 25 | 3067 | 53 8 15 | 3064 | 54 37 9 | 3060 |
| | Saturn | E. | 33 8 43 | 3063 | 31 39 48 | 3060 | 30 10 50 | 3058 | 28 41 49 | 3054 |
| | Fomalhaut | E. | 36 59 42 | 3901 | 35 46 23 | 3961 | 34 34 5 | 4028 | 33 22 53 | 4104 |
| | α Pegasi | E. | 57 28 34 | 3429 | 56 6 50 | 2438 | 54 45 17 | 3450 | 53 23 57 | 3462 |
| | α Arietis | E. | 98 8 51 | 3095 | 96 40 35 | 3092 | 95 12 16 | 3089 | 93 43 53 | 3086 |
| 25 | Sun | W. | 97 17 9 | 3424 | 98 38 58 | 3417 | 100 0 55 | 3410 | 101 23 0 | 3403 |
| | Jupiter | W. | 66 6 45 | 3137 | 67 34 10 | 3129 | 69 1 44 | 3122 | 70 29 27 | 3114 |
| | Antares | W. | 62 2 53 | 3036 | 63 32 21 | 3030 | 65 1 57 | 3023 | 66 31 41 | 3016 |
| | Saturn | E. | 21 15 28 | 3030 | 19 45 53 | 3025 | 18 16 11 | 3018 | 16 46 20 | 3010 |
| | α Pegasi | E. | 46 40 56 | 3538 | 45 21 14 | 3558 | 44 1 54 | 3580 | 42 42 58 | 3606 |
| | α Arietis | E. | 86 20 43 | 3061 | 84 51 46 | 3055 | 83 22 41 | 3048 | 81 53 28 | 3042 |
| 26 | Sun | W. | 108 15 46 | 3357 | 109 38 52 | 3346 | 111 2 10 | 3335 | 112 25 41 | 3325 |
| | Jupiter | W. | 77 50 33 | 3069 | 79 19 20 | 3059 | 80 48 20 | 3048 | 82 17 33 | 3037 |
| | Antares | W. | 74 2 49 | 2973 | 75 33 36 | 2962 | 77 4 36 | 2953 | 78 35 48 | 2942 |
| | α Arietis | E. | 74 25 4 | 3000 | 72 54 51 | 2990 | 71 24 26 | 2981 | 69 53 49 | 2970 |
| | Aldebaran | E. | 105 32 28 | 3052 | 104 3 19 | 3041 | 102 33 57 | 3030 | 101 4 21 | 3018 |
| 27 | Sun | W. | 119 26 38 | 3262 | 120 51 34 | 3249 | 122 16 45 | 3235 | 123 42 13 | 3221 |
| | Jupiter | W. | 89 47 11 | 2977 | 91 17 52 | 2965 | 92 48 49 | 2951 | 94 20 3 | 2938 |
| | Antares | W. | 86 15 23 | 2883 | 87 48 4 | 2870 | 89 21 1 | 2857 | 90 54 15 | 2843 |
| | α Arietis | E. | 62 17 24 | 2915 | 60 45 24 | 2904 | 59 13 10 | 2892 | 57 40 41 | 2880 |
| | Aldebaran | E. | 93 32 39 | 2957 | 92 1 32 | 2944 | 90 30 9 | 2931 | 88 58 29 | 2917 |
| 28 | Sun | W. | 130 53 45 | 3148 | 132 20 57 | 3133 | 133 48 26 | 3118 | 135 16 14 | 3103 |
| | Antares | W. | 98 44 52 | 2773 | 100 19 55 | 2759 | 101 55 17 | 2744 | 103 30 59 | 2729 |
| | α Aquilæ | W. | 53 27 55 | 4095 | 54 38 2 | 4028 | 55 49 14 | 3965 | 57 1 28 | 3907 |
| | α Arietis | E. | 49 54 18 | 2818 | 48 20 13 | 2805 | 46 45 52 | 2793 | 45 11 15 | 2780 |
| | Aldebaran | E. | 81 15 51 | 2849 | 79 42 27 | 2835 | 78 8 44 | 2821 | 76 34 43 | 2807 |
| 29 | α Aquilæ | W. | 63 16 38 | 3656 | 64 34 12 | 3613 | 65 52 32 | 3573 | 67 11 36 | 3534 |
| | α Arietis | E. | 37 14 15 | 2725 | 35 38 8 | 2716 | 34 1 49 | 2707 | 32 25 18 | 2700 |
| | Aldebaran | E. | 68 40 7 | 2738 | 67 4 18 | 2725 | 65 28 11 | 2711 | 63 51 46 | 2698 |
| 30 | α Aquilæ | W. | 73 56 55 | 3370 | 75 19 46 | 3342 | 76 43 9 | 3315 | 78 7 3 | 3291 |
| | Aldebaran | E. | 55 45 32 | 2640 | 54 7 31 | 2629 | 52 29 16 | 2620 | 50 50 48 | 2611 |
| 31 | α Aquilæ | W. | 85 13 12 | 3188 | 86 39 35 | 3173 | 88 6 17 | 3158 | 89 33 16 | 3146 |
| | Aldebaran | E. | 42 35 58 | 2584 | 40 56 41 | 2583 | 39 17 22 | 2584 | 37 38 5 | 2587 |

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Semi-diameter. | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be subtracted from Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Wed. | 1 | 14 28 5.68 | 9.815 | S. 14 38 36.3 | −47.74 | 16 10.06 | 67.02 | 16 19.26 | 0.040 |
| Thur. | 2 | 14 32 1.67 | 9.849 | 14 57 35.0 | 47.15 | 16 10.31 | 67.14 | 16 19.82 | −0.006 |
| Frid. | 3 | 14 35 58.48 | 9.884 | 15 16 19.1 | 46.53 | 16 10.55 | 67.25 | 16 19.57 | +0.028 |
| Sat. | 4 | 14 39 56.11 | 9.919 | 15 34 48.4 | 45.90 | 16 10.79 | 67.37 | 16 18.50 | 0.063 |
| *Sun.* | 5 | 14 43 54.57 | 9.954 | 15 53 2.3 | 45.26 | 16 11.03 | 67.49 | 16 16.60 | 0.098 |
| Mon. | 6 | 14 47 53.89 | 9.989 | 16 11 0.5 | 44.59 | 16 11.26 | 67.61 | 16 13.85 | 0.133 |
| Tues. | 7 | 14 51 54.07 | 10.025 | 16 28 42.4 | 43.91 | 16 11.49 | 67.73 | 16 10.23 | 0.168 |
| Wed. | 8 | 14 55 55.11 | 10.061 | 16 46 7.7 | 43.21 | 16 11.71 | 67.85 | 16 5.75 | 0.204 |
| Thur. | 9 | 14 59 57.02 | 10.097 | 17 3 16.3 | 42.59 | 16 11.93 | 67.97 | 16 0.41 | 0.240 |
| Frid. | 10 | 15 3 59.81 | 10.134 | 17 20 7.4 | 41.76 | 16 12.15 | 68.09 | 15 54.20 | 0.276 |
| Sat. | 11 | 15 8 3.46 | 10.170 | 17 36 40.6 | 41.01 | 16 12.37 | 68.21 | 15 47.12 | 0.312 |
| *Sun.* | 12 | 15 12 7.98 | 10.208 | 17 52 55.6 | 40.24 | 16 12.58 | 68.33 | 15 39.19 | 0.348 |
| Mon. | 13 | 15 16 13.35 | 10.244 | 18 8 52.0 | 39.45 | 16 12.79 | 68.45 | 15 30.40 | 0.384 |
| Tues. | 14 | 15 20 19.59 | 10.279 | 18 24 29.2 | 38.65 | 16 13.00 | 68.56 | 15 20.73 | 0.420 |
| Wed. | 15 | 15 24 26.71 | 10.314 | 18 39 47.1 | 37.83 | 16 13.21 | 68.68 | 15 10.19 | 0.456 |
| Thur. | 16 | 15 28 34.68 | 10.349 | 18 54 45.0 | 36.99 | 16 13.42 | 68.80 | 14 58.82 | 0.491 |
| Frid. | 17 | 15 32 43.48 | 10.383 | 19 9 22.8 | 36.14 | 16 13.63 | 68 92 | 14 46.62 | 0.526 |
| Sat. | 18 | 15 36 53.11 | 10.417 | 19 23 39.9 | 35.27 | 16 13.83 | 69.03 | 14 33.59 | 0.561 |
| *Sun.* | 19 | 15 41 3.56 | 10.451 | 19 37 35.9 | 34.38 | 16 14.03 | 69.15 | 14 19.73 | 0.595 |
| Mon. | 20 | 15 45 14.81 | 10.485 | 19 51 10.5 | 33.48 | 16 14.23 | 69.26 | 14 5.06 | 0.628 |
| Tues. | 21 | 15 49 26.86 | 10.518 | 20 4 23.3 | 32.56 | 16 14.43 | 69.37 | 13 49.60 | 0.660 |
| Wed. | 22 | 15 53 39.70 | 10.550 | 20 17 13.9 | 31.63 | 16 14.62 | 69.48 | 13 33.38 | 0.692 |
| Thur. | 23 | 15 57 53.29 | 10.582 | 20 29 41.8 | 30.68 | 16 14.81 | 69.59 | 13 16.39 | 0.724 |
| Frid. | 24 | 16 2 7.67 | 10.613 | 20 41 46.8 | 29.72 | 16 14.99 | 69.69 | 12 58.64 | 0.755 |
| Sat. | 25 | 16 6 22.77 | 10.644 | 20 53 28.6 | 28.75 | 16 15.17 | 69.79 | 12 40.14 | 0.785 |
| *Sun.* | 26 | 16 10 38.59 | 10.674 | 21 4 47.2 | 27.77 | 16 15.34 | 69.89 | 12 20.92 | 0.815 |
| Mon. | 27 | 16 14 55.11 | 10.703 | 21 15 42.0 | 26.77 | 16 15.51 | 69.99 | 12 1.00 | 0.844 |
| Tues. | 28 | 16 19 12.34 | 10.732 | 21 26 12.5 | 25.76 | 16 15.68 | 70.09 | 11 40.40 | 0.873 |
| Wed. | 29 | 16 23 30.25 | 10.760 | 21 36 18.5 | 24.73 | 16 15.84 | 70.18 | 11 19.11 | 0.901 |
| Thur. | 30 | 16 27 48.83 | 10.787 | 21 45 59.9 | 23.70 | 16 16.00 | 70.27 | 10 57.15 | 0.929 |
| Frid. | 31 | 16 32 8.05 | 10.813 | S. 21 55 16.4 | −22.65 | 16 16.15 | 70.36 | 10 34.54 | 0.955 |

NOTE.—Mean Time of the Semidiameter passing may be found by subtracting $0^{s}.19$ from the Sidereal Time.

— prefixed to the hourly change of declination, indicates that south declinations are increasing.

# NOVEMBER, 1876.

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S *Apparent* Right Ascension. | THE SUN'S Diff. for 1 hour. | THE SUN'S *Apparent* Declination. | THE SUN'S Diff. for 1 hour. | Equation of Time, *to be added to Mean Time.* | Diff. for 1 hour. | Sidereal Time or Right Ascension of *Mean* Sun. |
|---|---|---|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Wed. | 1 | 14 28 8.35 | 9.816 | S. 14 38 49.3 | −47.74 | 16 19.27 | 0.040 | 14 44 27.62 |
| Thur. | 2 | 14 32 4.35 | 9.850 | 14 57 47.9 | 47.14 | 16 19.83 | −0.006 | 14 48 24.18 |
| Frid. | 3 | 14 36 1.16 | 9.884 | 15 16 31.8 | 46.52 | 16 19.57 | +0.028 | 14 52 20.73 |
| Sat. | 4 | 14 39 58.80 | 9.919 | 15 35 0.8 | 45.89 | 16 18.49 | 0.063 | 14 56 17.29 |
| *Sun.* | 5 | 14 43 57.27 | 9.954 | 15 53 14.5 | 45.25 | 16 16.57 | 0.098 | 15 0 13.84 |
| Mon. | 6 | 14 47 56.59 | 9.989 | 16 11 12.5 | 44.58 | 16 13.81 | 0.133 | 15 4 10.40 |
| Tues. | 7 | 14 51 56.77 | 10.025 | 16 28 54.2 | 43.90 | 16 10.18 | 0.168 | 15 8 6.95 |
| Wed. | 8 | 14 55 57.81 | 10.061 | 16 46 19.3 | 43.20 | 16 5.70 | 0.204 | 15 12 3.51 |
| Thur. | 9 | 14 59 59.71 | 10.097 | 17 3 27.6 | 42.58 | 16 0.35 | 0.240 | 15 16 0.06 |
| Frid. | 10 | 15 4 2.49 | 10.134 | 17 20 18.4 | 41.75 | 15 54.13 | 0.276 | 15 19 56.62 |
| Sat. | 11 | 15 8 6.13 | 10.170 | 17 36 51.4 | 41.00 | 15 47.04 | 0.312 | 15 23 53.17 |
| *Sun.* | 12 | 15 12 10.64 | 10.207 | 17 53 6.1 | 40.23 | 15 39.10 | 0.348 | 15 27 49.74 |
| Mon. | 13 | 15 16 16.00 | 10.243 | 18 9 2.2 | 39.44 | 15 30.30 | 0.384 | 15 31 46.30 |
| Tues. | 14 | 15 20 22.22 | 10.278 | 18 24 39.1 | 38.64 | 15 20.63 | 0.420 | 15 35 42.85 |
| Wed. | 15 | 15 24 29.32 | 10.313 | 18 39 56.7 | 37.82 | 15 10.08 | 0.456 | 15 39 39.40 |
| Thur. | 16 | 15 28 37.27 | 10.348 | 18 54 54.3 | 36.98 | 14 58.70 | 0.491 | 15 43 35.97 |
| Frid. | 17 | 15 32 46.14 | 10.382 | 19 9 31.8 | 36.13 | 14 46.49 | 0.526 | 15 47 32.53 |
| Sat. | 18 | 15 36 55.64 | 10.416 | 19 23 48.5 | 35.26 | 14 33.47 | 0.561 | 15 51 29.08 |
| *Sun.* | 19 | 15 41 6.06 | 10.450 | 19 37 44.1 | 34.37 | 14 19.57 | 0.595 | 15 55 25.63 |
| Mon. | 20 | 15 45 17.28 | 10.484 | 19 51 18.4 | 33.47 | 14 4.91 | 0.628 | 15 59 22.19 |
| Tues. | 21 | 15 49 29.29 | 10.517 | 20 4 30.8 | 32.55 | 13 49.45 | 0.660 | 16 3 18.74 |
| Wed. | 22 | 15 53 42.08 | 10.549 | 20 17 21.0 | 31.62 | 13 33.23 | 0.692 | 16 7 15.31 |
| Thur. | 23 | 15 57 55.64 | 10.581 | 20 29 48.6 | 30.67 | 13 16.23 | 0.724 | 16 11 11.87 |
| Frid. | 24 | 16 2 9.97 | 10.612 | 20 41 53.2 | 29.71 | 12 58.46 | 0.755 | 16 15 8.43 |
| Sat. | 25 | 16 6 25.02 | 10.642 | 20 53 34.7 | 28.74 | 12 39.97 | 0.785 | 16 19 4.99 |
| *Sun.* | 26 | 16 10 40.79 | 10.672 | 21 4 52.9 | 27.76 | 12 20.75 | 0.815 | 16 23 1.54 |
| Mon. | 27 | 16 14 57.26 | 10.701 | 21 15 47.3 | 26.76 | 12 0.83 | 0.844 | 16 26 58.09 |
| Tues. | 28 | 16 19 14.43 | 10.730 | 21 26 17.4 | 25.75 | 11 40.23 | 0.873 | 16 30 54.66 |
| Wed. | 29 | 16 23 32.28 | 10.758 | 21 36 23.2 | 24.72 | 11 18.94 | 0.901 | 16 34 51.22 |
| Thur. | 30 | 16 27 50.80 | 10.785 | 21 46 4.2 | 23.69 | 10 56.98 | 0.929 | 16 38 47.78 |
| Frid. | 31 | 16 32 9.96 | 10.811 | S. 21 55 20.4 | −22.64 | 10 34.38 | 0.955 | 16 42 44.34 |

**Note.**—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

— prefixed to the hourly change of declination, indicates that north declinations are decreasing.

Diff. for 1 hour.
+9ˢ.8565

## AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | *True* LONGITUDE. | | Diff. for 1 hour. | LATITUDE. | | | |
| | | λ | λ′ | | | | | |
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 306 | 219 26 32.6 | 25 48.1 | 150.26 | +0.40 | 0.0063778 | −46.3 | 9 14 1.36 |
| 2 | 307 | 220 26 39.4 | 25 54.8 | 150.33 | 0.47 | .0062673 | 45.6 | 9 10 5.45 |
| 3 | 308 | 221 26 48.2 | 26 3.5 | 150.40 | 0.51 | .0061585 | 45.0 | 9 6 9.54 |
| 4 | 309 | 222 26 58.8 | 26 13.9 | 150.48 | 0.52 | .0060514 | 44.3 | 9 2 13.63 |
| 5 | 310 | 223 27 11.3 | 26 26.2 | 150.56 | 0.49 | .0059460 | 43.6 | 8 58 17.72 |
| 6 | 311 | 224 27 25.8 | 26 40.5 | 150.65 | 0.45 | .0058422 | 42.9 | 8 54 21.81 |
| 7 | 312 | 225 27 42.4 | 26 57.0 | 150.73 | 0.37 | .0057400 | 42.2 | 8 50 25.90 |
| 8 | 313 | 226 28 1.1 | 27 15.6 | 150.82 | 0.27 | .0056391 | 41.6 | 8 46 29.99 |
| 9 | 314 | 227 28 21.8 | 27 36.2 | 150.90 | 0.15 | .0055396 | 41.1 | 8 42 34.08 |
| 10 | 315 | 228 28 44.5 | 27 58.6 | 150.98 | +0.03 | .0054414 | 40.6 | 8 38 38.17 |
| 11 | 316 | 229 29 9.0 | 28 22.9 | 151.06 | −0.10 | .0053444 | 40.1 | 8 34 42.25 |
| 12 | 317 | 230 29 35.5 | 28 49.3 | 151.14 | 0.23 | .0052485 | 39.7 | 8 30 46.34 |
| 13 | 318 | 231 30 3.9 | 29 17.6 | 151.22 | 0.36 | .0051536 | 39.3 | 8 26 50.43 |
| 14 | 319 | 232 30 34.0 | 29 47.5 | 151.29 | 0.46 | .0050595 | 39.0 | 8 22 54.52 |
| 15 | 320 | 233 31 5.7 | 30 19.0 | 151.36 | 0.55 | .0049663 | 38.6 | 8 18 58.61 |
| 16 | 321 | 234 31 39.1 | 30 52.2 | 151.42 | 0.61 | .0048740 | 38.3 | 8 15 2.70 |
| 17 | 322 | 235 32 14.1 | 31 27.1 | 151.49 | 0.63 | .0047826 | 37.9 | 8 11 6.79 |
| 18 | 323 | 236 32 50.6 | 32 3.5 | 151.55 | 0.64 | .0046923 | 37.4 | 8 7 10.88 |
| 19 | 324 | 237 33 28.4 | 32 41.2 | 151.60 | 0.60 | .0046031 | 36.9 | 8 3 14.97 |
| 20 | 325 | 238 34 7.5 | 33 20.0 | 151.65 | 0.55 | .0045151 | 36.4 | 7 59 19.06 |
| 21 | 326 | 239 34 47.8 | 34 0.1 | 151.70 | 0.46 | .0044281 | 35.8 | 7 55 23.15 |
| 22 | 327 | 240 35 29.2 | 34 41.4 | 151.75 | 0.36 | .0043424 | 35.2 | 7 51 27.24 |
| 23 | 328 | 241 36 11.8 | 35 23.8 | 151.80 | 0.24 | .0042582 | 34.5 | 7 47 31.32 |
| 24 | 329 | 242 36 55.5 | 36 7.3 | 151.84 | −0.11 | .0041760 | 33.8 | 7 43 35.41 |
| 25 | 330 | 243 37 40.2 | 36 51.8 | 151.89 | +0.03 | .0040956 | 33.0 | 7 39 39.50 |
| 26 | 331 | 244 38 25.9 | 37 37.3 | 151.93 | 0.16 | .0040171 | 32.2 | 7 35 43.59 |
| 27 | 332 | 245 39 12.6 | 38 23.9 | 151.97 | 0.27 | .0039406 | 31.3 | 7 31 47.67 |
| 28 | 333 | 246 40 0.3 | 39 11.4 | 152.01 | 0.38 | .0038663 | 30.3 | 7 27 51.76 |
| 29 | 334 | 247 40 49.0 | 39 59.9 | 152.05 | 0.45 | .0037945 | 29.4 | 7 23 55.85 |
| 30 | 335 | 248 41 38.7 | 40 49.4 | 152.09 | 0.50 | .0037252 | 28.4 | 7 19 59.94 |
| 31 | 336 | 249 42 29.5 | 41 40.0 | 152.14 | +0.51 | 0.0036584 | −27.4 | 7 16 4.02 |

NOTE: λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
−9ˢ.8296

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | SEMIDIAMETER. |  | HORIZONTAL PARALLAX. |  |  |  | MERIDIAN PASSAGE. |  | AGE. |
|---|---|---|---|---|---|---|---|---|---|
|  | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. |  | Diff. for 1 hour. | Noon. |
|  | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 15 58.4 | 16 3.4 | 58 30.9 | +1.62 | 58 49.3 | +1.45 | 11 38.6 | 2.21 | 15.1 |
| 2 | 16 7.9 | 16 11.6 | 59 5.6 | 1.26 | 59 19.4 | 1.05 | 12 34.1 | 2.42 | 16.1 |
| 3 | 16 14.7 | 16 17.0 | 59 30.7 | 0.83 | 59 39.2 | 0.59 | 13 34.5 | 2.61 | 17.1 |
| 4 | 16 18.6 | 16 19.4 | 59 44.9 | +0.36 | 59 47.8 | +0.13 | 14 38.3 | 2.69 | 18.1 |
| 5 | 16 19.5 | 16 18.9 | 59 48.1 | –0.08 | 59 45.9 | –0.28 | 15 42.7 | 2.65 | 19.1 |
| 6 | 16 17.7 | 16 15.9 | 59 41.5 | 0.45 | 59 35.1 | 0.60 | 16 44.5 | 2.49 | 20.1 |
| 7 | 16 13.7 | 16 11.2 | 59 27.1 | 0.73 | 59 17.7 | 0.84 | 17 42.0 | 2.29 | 21.1 |
| 8 | 16 8.3 | 16 5.2 | 59 7.1 | 0.92 | 58 55.6 | 0.99 | 18 34.6 | 2.10 | 22.1 |
| 9 | 16 1.8 | 15 58.4 | 58 43.4 | 1.04 | 58 30.7 | 1.08 | 19 23.3 | 1.96 | 23.1 |
| 10 | 15 54.8 | 15 51.1 | 58 17.6 | 1.11 | 58 4.1 | 1.13 | 20 9.4 | 1.88 | 24.1 |
| 11 | 15 47.4 | 15 43.6 | 57 50.4 | 1.15 | 57 36.4 | 1.18 | 20 54.1 | 1.86 | 25.1 |
| 12 | 15 39.7 | 15 35.8 | 57 22.2 | 1.20 | 57 7.7 | 1.21 | 21 38.9 | 1.88 | 26.1 |
| 13 | 15 31.8 | 15 27.8 | 56 53.1 | 1.22 | 56 38.4 | 1.23 | 22 24.9 | 1.95 | 27.1 |
| 14 | 15 23.8 | 15 19.7 | 56 23.6 | 1.24 | 56 8.8 | 1.23 | 23 12.8 | 2.04 | 28.1 |
| 15 | 15 15.7 | 15 11.8 | 55 54.2 | 1.21 | 55 39.8 | 1.19 | ☌ |  | 29.1 |
| 16 | 15 8.0 | 15 4.3 | 55 25.7 | 1.15 | 55 12.2 | 1.10 | 0 3.0 | 2.13 | 0.5 |
| 17 | 15 0.9 | 14 57.6 | 54 59.4 | 1.03 | 54 47.5 | 0.95 | 0 55.0 | 2.20 | 1.5 |
| 18 | 14 54.7 | 14 52.1 | 54 36.7 | 0.84 | 54 27.3 | 0.72 | 1 47.9 | 2.20 | 2.5 |
| 19 | 14 50.0 | 14 48.3 | 54 19.4 | 0.59 | 54 13.2 | 0.44 | 2 40.2 | 2.15 | 3.5 |
| 20 | 14 47.1 | 14 46.5 | 54 8.9 | –0.27 | 54 6.7 | –0.09 | 3 30.8 | 2.05 | 4.5 |
| 21 | 14 46.5 | 14 47.2 | 54 6.7 | +0.10 | 54 9.1 | +0.30 | 4 18.7 | 1.94 | 5.5 |
| 22 | 14 48.5 | 14 50.5 | 54 14.0 | 0.51 | 54 21.4 | 0.73 | 5 4.0 | 1.83 | 6.5 |
| 23 | 14 53.3 | 14 56.7 | 54 31.4 | 0.95 | 54 44.1 | 1.16 | 5 47.0 | 1.75 | 7.5 |
| 24 | 15 0.8 | 15 5.6 | 54 59.2 | 0.36 | 55 16.8 | 1.56 | 6 28.6 | 1.71 | 8.5 |
| 25 | 15 11.0 | 15 17.0 | 55 36.6 | 0.74 | 55 58.6 | 1.91 | 7 9.8 | 1.73 | 9.5 |
| 26 | 15 23.4 | 15 30.4 | 56 22.4 | 2.06 | 56 47.8 | 2.16 | 7 51.9 | 1.79 | 10.5 |
| 27 | 15 37.5 | 15 44.9 | 57 14.2 | 2.24 | 57 41.4 | 2.28 | 8 36.3 | 1.91 | 11.5 |
| 28 | 15 52.4 | 15 59.6 | 58 8.6 | 2.26 | 58 35.4 | 2.20 | 9 24.3 | 2.10 | 12.5 |
| 29 | 16 6.7 | 16 13.2 | 59 1.1 | 2.08 | 59 25.1 | 1.91 | 10 17.5 | 2.34 | 13.5 |
| 30 | 16 19.1 | 16 24.1 | 59 46.7 | 2.68 | 60 5.3 | 1.42 | 11 16.4 | 2.58 | 14.5 |
| 31 | 16 28.3 | 16 31.5 | 60 20.7 | +2.13 | 60 32.3 | +0.80 | 12 20.6 | 2.75 | 15.5 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | WEDNESDAY 1. | | | | | FRIDAY 3. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 1 58 51.76 | 2.2035 | N.15 57 0.0 | 14.091 | 0 | 3 53 33.33 | 2.5747 | N.25 15 42.3 | 8.431 |
| 1 | 2 1 4.19 | 2.2107 | 16 11 3.3 | 14.018 | 1 | 3 56 8.02 | 2.5817 | 25 24 3.2 | 8.266 |
| 2 | 2 3 17.05 | 2.2180 | 16 25 2.2 | 13.945 | 2 | 3 58 43.13 | 2.5886 | 25 32 14.2 | 8.099 |
| 3 | 2 5 30.35 | 2.2253 | 16 38 56.7 | 13.870 | 3 | 4 1 18.65 | 2.5953 | 25 40 15.1 | 7.930 |
| 4 | 2 7 44.09 | 2.2327 | 16 52 46.6 | 13.792 | 4 | 4 3 54.57 | 2.6020 | 25 48 5.8 | 7.760 |
| 5 | 2 9 58.28 | 2.2402 | 17 6 31.8 | 13.712 | 5 | 4 6 30.89 | 2.6086 | 25 55 46.3 | 7.588 |
| 6 | 2 12 12.92 | 2.2478 | 17 20 12.1 | 13.631 | 6 | 4 9 7.60 | 2.6151 | 26 3 16.4 | 7.414 |
| 7 | 2 14 28.02 | 2.2555 | 17 33 47.5 | 13.547 | 7 | 4 11 44.70 | 2.6214 | 26 10 36.0 | 7.239 |
| 8 | 2 16 43.58 | 2.2632 | 17 47 17.8 | 13.462 | 8 | 4 14 22.17 | 2.6276 | 26 17 45.1 | 7.062 |
| 9 | 2 18 59.60 | 2.2708 | 18 0 42.9 | 13.375 | 9 | 4 17 0.01 | 2.6337 | 26 24 43.5 | 6.884 |
| 10 | 2 21 16.08 | 2.2785 | 18 14 2.8 | 13.286 | 10 | 4 19 38.22 | 2.6398 | 26 31 31.2 | 6.705 |
| 11 | 2 23 33.02 | 2.2862 | 18 27 17.3 | 13.195 | 11 | 4 22 16.79 | 2.6457 | 26 38 8.1 | 6.523 |
| 12 | 2 25 50.42 | 2.2939 | 18 40 26.2 | 13.102 | 12 | 4 24 55.70 | 2.6514 | 26 44 34.0 | 6.340 |
| 13 | 2 28 8.29 | 2.3018 | 18 53 29.5 | 13.007 | 13 | 4 27 34.95 | 2.6569 | 26 50 48.9 | 6.156 |
| 14 | 2 30 26.63 | 2.3097 | 19 6 27.0 | 12.910 | 14 | 4 30 14.53 | 2.6623 | 26 56 52.7 | 5.971 |
| 15 | 2 32 45.45 | 2.3176 | 19 19 18.7 | 12.811 | 15 | 4 32 54.43 | 2.6676 | 27 2 45.4 | 5.785 |
| 16 | 2 35 4.74 | 2.3255 | 19 32 4.4 | 12.710 | 16 | 4 35 34.64 | 2.6728 | 27 8 26.9 | 5.597 |
| 17 | 2 37 24.51 | 2.3334 | 19 44 43.9 | 12.607 | 17 | 4 38 15.16 | 2.6778 | 27 13 57.0 | 5.406 |
| 18 | 2 39 44.75 | 2.3413 | 19 57 17.2 | 12.502 | 18 | 4 40 55.97 | 2.6826 | 27 19 15.6 | 5.214 |
| 19 | 2 42 5.47 | 2.3493 | 20 9 44.1 | 12.395 | 19 | 4 43 37.07 | 2.6872 | 27 24 22.7 | 5.022 |
| 20 | 2 44 26.67 | 2.3573 | 20 22 4.6 | 12.286 | 20 | 4 46 18.44 | 2.6917 | 27 29 18.3 | 4.830 |
| 21 | 2 46 48.35 | 2.3653 | 20 34 18.5 | 12.175 | 21 | 4 49 0.07 | 2.6960 | 27 34 2.3 | 4.636 |
| 22 | 2 49 10.51 | 2.3733 | 20 46 25.6 | 12.062 | 22 | 4 51 41.96 | 2.7002 | 27 38 34.6 | 4.441 |
| 23 | 2 51 33.15 | 2.3814 | N.20 58 25.9 | 11.947 | 23 | 4 54 24.09 | 2.7041 | N.27 42 55.2 | 4.245 |
| | THURSDAY 2. | | | | | SATURDAY 4. | | | |
| 0 | 2 53 56.28 | 2.3895 | N.21 10 19.3 | 11.831 | 0 | 4 57 6.45 | 2.7079 | N.27 47 4.0 | 4.047 |
| 1 | 2 56 19.89 | 2.3975 | 21 22 5.6 | 11.712 | 1 | 4 59 49.04 | 2.7115 | 27 51 0.9 | 3.849 |
| 2 | 2 58 43.98 | 2.4055 | 21 33 44.7 | 11.590 | 2 | 5 2 31.84 | 2.7150 | 27 54 45.9 | 3.650 |
| 3 | 3 1 8.55 | 2.4135 | 21 45 16.4 | 11.467 | 3 | 5 5 14.84 | 2.7182 | 27 58 18.9 | 3.450 |
| 4 | 3 3 33.60 | 2.4215 | 21 56 40.7 | 11.342 | 4 | 5 7 58.03 | 2.7213 | 28 1 39.9 | 3.250 |
| 5 | 3 5 59.13 | 2.4296 | 22 7 57.5 | 11.216 | 5 | 5 10 41.40 | 2.7242 | 28 4 48.9 | 3.048 |
| 6 | 3 8 25.15 | 2.4377 | 22 19 6.6 | 11.087 | 6 | 5 13 24.93 | 2.7268 | 28 7 45.7 | 2.845 |
| 7 | 3 10 51.65 | 2.4456 | 22 30 7.9 | 10.956 | 7 | 5 16 8.62 | 2.7293 | 28 10 30.3 | 2.642 |
| 8 | 3 13 18.62 | 2.4535 | 22 41 1.3 | 10.822 | 8 | 5 18 52.45 | 2.7317 | 28 13 2.7 | 2.439 |
| 9 | 3 15 46.07 | 2.4614 | 22 51 46.6 | 10.687 | 9 | 5 21 36.42 | 2.7338 | 28 15 23.0 | 2.237 |
| 10 | 3 18 13.99 | 2.4693 | 23 2 23.8 | 10.551 | 10 | 5 24 20.51 | 2.7357 | 28 17 31.1 | 2.033 |
| 11 | 3 20 42.39 | 2.4772 | 23 12 52.7 | 10.412 | 11 | 5 27 4.70 | 2.7373 | 28 19 26.9 | 1.827 |
| 12 | 3 23 11.26 | 2.4851 | 23 23 13.2 | 10.271 | 12 | 5 29 48.98 | 2.7388 | 28 21 10.3 | 1.621 |
| 13 | 3 25 40.60 | 2.4928 | 23 33 25.2 | 10.128 | 13 | 5 32 33.35 | 2.7401 | 28 22 41.4 | 1.415 |
| 14 | 3 28 10.40 | 2.5006 | 23 43 28.6 | 9.983 | 14 | 5 35 17.79 | 2.7412 | 28 24 0.1 | 1.209 |
| 15 | 3 30 40.67 | 2.5083 | 23 53 23.2 | 9.836 | 15 | 5 38 2.29 | 2.7421 | 28 25 6.5 | 1.003 |
| 16 | 3 33 11.40 | 2.5159 | 24 3 8.9 | 9.687 | 16 | 5 40 46.84 | 2.7427 | 28 26 0.5 | 0.797 |
| 17 | 3 35 42.58 | 2.5235 | 24 12 45.7 | 9.537 | 17 | 5 43 31.42 | 2.7432 | 28 26 42.1 | 0.590 |
| 18 | 3 38 14.22 | 2.5311 | 24 22 13.4 | 9.385 | 18 | 5 46 16.03 | 2.7435 | 28 27 11.3 | 0.384 |
| 19 | 3 40 46.31 | 2.5385 | 24 31 31.9 | 9.231 | 19 | 5 49 0.64 | 2.7435 | 28 27 28.2 | +0.178 |
| 20 | 3 43 18.84 | 2.5458 | 24 40 41.1 | 9.074 | 20 | 5 51 45.25 | 2.7434 | 28 27 32.7 | −0.029 |
| 21 | 3 45 51.81 | 2.5531 | 24 49 40.8 | 8.910 | 21 | 5 54 29.85 | 2.7431 | 28 27 24.7 | 0.236 |
| 22 | 3 48 25.22 | 2.5604 | 24 58 31.0 | 8.756 | 22 | 5 57 14.42 | 2.7425 | 28 27 4.3 | 0.442 |
| 23 | 3 50 59.06 | 2.5676 | 25 7 11.5 | 8.594 | 23 | 5 59 58.95 | 2.7417 | 28 26 31.6 | 0.648 |
| 24 | 3 53 33.33 | 2.5747 | N.25 15 42.3 | 8,431 | 24 | 6 2 43.42 | 2.7407 | N.28 25 46.5 | 0.855 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | **SUNDAY 5.** | | | | | **TUESDAY 7.** | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 6 2 43.42 | 2.7407 | N.28 25 46.5 | 0.855 | 0 | 8 9 49.79 | 2.5038 | N.24 2 6.9 | 9.657 |
| 1 | 6 5 27.83 | 2.7395 | 28 24 49.0 | 1.061 | 1 | 8 12 19.79 | 2.4963 | 23 52 23.0 | 9.804 |
| 2 | 6 8 12.16 | 2.7382 | 28 23 39.2 | 1.266 | 2 | 8 14 49.35 | 2.4889 | 23 42 30.4 | 9.949 |
| 3 | 6 10 56.41 | 2.7367 | 28 22 17.1 | 1.471 | 3 | 8 17 18.46 | 2.4814 | 23 32 29.1 | 10.093 |
| 4 | 6 13 40.56 | 2.7348 | 28 20 42.7 | 1.676 | 4 | 8 19 47.12 | 2.4739 | 23 22 19.2 | 10.235 |
| 5 | 6 16 24.59 | 2.7328 | 28 18 56.0 | 1.881 | 5 | 8 22 15.33 | 2.4664 | 23 12 0.9 | 10.375 |
| 6 | 6 19 8.50 | 2.7307 | 28 16 57.0 | 2.085 | 6 | 8 24 43.09 | 2.4588 | 23 1 34.2 | 10.514 |
| 7 | 6 21 52.27 | 2.7283 | 28 14 45.8 | 2.288 | 7 | 8 27 10.39 | 2.4512 | 22 50 59.2 | 10.651 |
| 8 | 6 24 35.90 | 2.7258 | 28 12 22.5 | 2.490 | 8 | 8 29 37.24 | 2.4437 | 22 40 16.1 | 10.785 |
| 9 | 6 27 19.37 | 2.7231 | 28 9 47.0 | 2.692 | 9 | 8 32 3.63 | 2.4361 | 22 29 25.0 | 10.917 |
| 10 | 6 30 2.67 | 2.7201 | 28 6 59.4 | 2.894 | 10 | 8 34 29.57 | 2.4285 | 22 18 26.0 | 11.049 |
| 11 | 6 32 45.78 | 2.7169 | 28 3 59.7 | 3.094 | 11 | 8 36 55.05 | 2.4209 | 22 7 19.1 | 11.170 |
| 12 | 6 35 28.70 | 2.7137 | 28 0 48.1 | 3.293 | 12 | 8 39 20.08 | 2.4133 | 21 56 4.5 | 11.307 |
| 13 | 6 38 11.42 | 2.7102 | 27 57 24.5 | 3.492 | 13 | 8 41 44.65 | 2.4057 | 21 44 42.3 | 11.432 |
| 14 | 6 40 53.92 | 2.7065 | 27 53 49.0 | 3.691 | 14 | 8 44 8.77 | 2.3982 | 21 33 12.6 | 11.556 |
| 15 | 6 43 36.20 | 2.7027 | 27 50 1.6 | 3.888 | 15 | 8 46 32.43 | 2.3906 | 21 21 35.6 | 11.677 |
| 16 | 6 46 18.25 | 2.6987 | 27 46 2.4 | 4.084 | 16 | 8 48 55.64 | 2.3830 | 21 9 51.3 | 11.797 |
| 17 | 6 49 0.05 | 2.6946 | 27 41 51.5 | 4.279 | 17 | 8 51 18.39 | 2.3754 | 20 57 59.9 | 11.916 |
| 18 | 6 51 41.60 | 2.6903 | 27 37 28.9 | 4.473 | 18 | 8 53 40.69 | 2.3679 | 20 46 1.4 | 12.032 |
| 19 | 6 54 22.88 | 2.6858 | 27 32 54.7 | 4.667 | 19 | 8 56 2.54 | 2.3604 | 20 33 56.0 | 12.147 |
| 20 | 6 57 3.89 | 2.6812 | 27 28 8.9 | 4.858 | 20 | 8 58 23.94 | 2.3530 | 20 21 43.8 | 12.260 |
| 21 | 6 59 44.62 | 2.6763 | 27 23 11.7 | 5.048 | 21 | 9 0 44.90 | 2.3456 | 20 9 24.8 | 12.372 |
| 22 | 7 2 25.05 | 2.6713 | 27 18 3.1 | 5.238 | 22 | 9 3 5.42 | 2.3382 | 19 56 59.2 | 12.481 |
| 23 | 7 5 5.18 | 2.6663 | N.27 12 43.1 | 5.427 | 23 | 9 5 25.49 | 2.3308 | N.19 44 27.1 | 12.588 |
| | **MONDAY 6.** | | | | | **WEDNESDAY 8.** | | | |
| 0 | 7 7 45.01 | 2.6612 | N.27 7 11.8 | 5.614 | 0 | 9 7 45.12 | 2.3235 | N.19 31 48.7 | 12.693 |
| 1 | 7 10 24.52 | 2.6558 | 27 1 29.4 | 5.799 | 1 | 9 10 4.31 | 2.3162 | 19 19 4.0 | 12.797 |
| 2 | 7 13 3.70 | 2.6502 | 26 55 35.9 | 5.984 | 2 | 9 12 23.07 | 2.3090 | 19 6 13.1 | 12.899 |
| 3 | 7 15 42.54 | 2.6445 | 26 49 31.3 | 6.168 | 3 | 9 14 41.39 | 2.3017 | 18 53 16.1 | 12.999 |
| 4 | 7 18 21.04 | 2.6388 | 26 43 15.7 | 6.350 | 4 | 9 16 59.28 | 2.2946 | 18 40 13.2 | 13.097 |
| 5 | 7 20 59.20 | 2.6330 | 26 36 49.3 | 6.529 | 5 | 9 19 16.74 | 2.2874 | 18 27 4.5 | 13.193 |
| 6 | 7 23 37.00 | 2.6269 | 26 30 12.2 | 6.707 | 6 | 9 21 33.77 | 2.2803 | 18 13 50.0 | 13.288 |
| 7 | 7 26 14.43 | 2.6208 | 26 23 24.4 | 6.885 | 7 | 9 23 50.38 | 2.2733 | 18 0 29.9 | 13.382 |
| 8 | 7 28 51.49 | 2.6146 | 26 16 26.0 | 7.062 | 8 | 9 26 6.57 | 2.2664 | 17 47 4.2 | 13.473 |
| 9 | 7 31 28.18 | 2.6083 | 26 9 17.0 | 7.237 | 9 | 9 28 22.35 | 2.2595 | 17 33 33.1 | 13.563 |
| 10 | 7 34 4.49 | 2.6019 | 26 1 57.6 | 7.409 | 10 | 9 30 37.71 | 2.2527 | 17 19 56.7 | 13.651 |
| 11 | 7 36 40.41 | 2.5953 | 25 54 27.9 | 7.580 | 11 | 9 32 52.67 | 2.2459 | 17 6 15.0 | 13.737 |
| 12 | 7 39 15.93 | 2.5887 | 25 46 48.0 | 7.750 | 12 | 9 35 7.22 | 2.2392 | 16 52 28.2 | 13.822 |
| 13 | 7 41 51.06 | 2.5821 | 25 38 57.9 | 7.918 | 13 | 9 37 21.37 | 2.2325 | 16 38 36.4 | 13.904 |
| 14 | 7 44 25.78 | 2.5753 | 25 30 57.8 | 8.084 | 14 | 9 39 35.12 | 2.2259 | 16 24 39.7 | 13.985 |
| 15 | 7 47 0.09 | 2.5684 | 25 22 47.8 | 8.248 | 15 | 9 41 48.48 | 2.2194 | 16 10 38.2 | 14.064 |
| 16 | 7 49 33.99 | 2.5615 | 25 14 28.0 | 8.412 | 16 | 9 44 1.45 | 2.2129 | 15 56 32.0 | 14.142 |
| 17 | 7 52 7.47 | 2.5544 | 25 5 58.4 | 8.574 | 17 | 9 46 14.03 | 2.2065 | 15 42 21.2 | 14.218 |
| 18 | 7 54 40.52 | 2.5473 | 24 57 19.1 | 8.734 | 18 | 9 48 26.23 | 2.2002 | 15 28 5.9 | 14.292 |
| 19 | 7 57 13.15 | 2.5402 | 24 48 30.3 | 8.892 | 19 | 9 50 38.05 | 2.1939 | 15 13 46.2 | 14.364 |
| 20 | 7 59 45.35 | 2.5331 | 24 39 32.1 | 9.048 | 20 | 9 52 49.50 | 2.1878 | 14 59 22.2 | 14.435 |
| 21 | 8 2 17.12 | 2.5258 | 24 30 24.5 | 9.203 | 21 | 9 55 0.59 | 2.1817 | 14 44 54.0 | 14.504 |
| 22 | 8 4 48.45 | 2.5185 | 24 21 7.7 | 9.356 | 22 | 9 57 11.31 | 2.1757 | 14 30 21.7 | 14.572 |
| 23 | 8 7 19.34 | 2.5112 | 24 11 41.8 | 9.507 | 23 | 9 59 21.67 | 2.1697 | 14 15 45.3 | 14.639 |
| 24 | 8 9 49.79 | 2.5038 | N.24 2 6.9 | 9.657 | 24 | 10 1 31.67 | 2.1637 | N.14 1 5.0 | 14.703 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | THURSDAY 9. | | | | | SATURDAY 11. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 10 1 31.67 | 2.1637 | N.14 1 5.0 | 14.703 | 0 | 11 40 13.58 | 1.9825 | N. 1 29 24.7 | 16.083 |
| 1 | 10 3 41.32 | 2.1580 | 13 46 20.9 | 14.766 | 1 | 11 42 12.48 | 1.9809 | 1 13 19.8 | 16.080 |
| 2 | 10 5 50.63 | 2.1523 | 13 31 33.1 | 14.827 | 2 | 11 44 11.29 | 1.9795 | 0 57 15.1 | 16.076 |
| 3 | 10 7 59.60 | 2.1467 | 13 16 41.7 | 14.887 | 3 | 11 46 10.02 | 1.9781 | 0 41 10.7 | 16.070 |
| 4 | 10 10 8.23 | 2.1411 | 13 1 46.7 | 14.945 | 4 | 11 48 8.66 | 1.9767 | 0 25 6.7 | 16.062 |
| 5 | 10 12 16.53 | 2.1356 | 12 46 48.3 | 15.002 | 5 | 11 50 7.22 | 1.9754 | N. 0 9 3.2 | 16.053 |
| 6 | 10 14 24.50 | 2.1302 | 12 31 46.5 | 15.057 | 6 | 11 52 5.71 | 1.9742 | S. 0 6 59.7 | 16.043 |
| 7 | 10 16 32.15 | 2.1248 | 12 16 41.5 | 15.110 | 7 | 11 54 4.13 | 1.9731 | 0 23 2.0 | 16.033 |
| 8 | 10 18 39.48 | 2.1197 | 12 1 33.3 | 15.162 | 8 | 11 56 2.48 | 1.9721 | 0 39 3.6 | 16.021 |
| 9 | 10 20 46.51 | 2.1146 | 11 46 22.0 | 15.212 | 9 | 11 58 0.78 | 1.9712 | 0 55 4.5 | 16.008 |
| 10 | 10 22 53.23 | 2.1094 | 11 31 7.8 | 15.261 | 10 | 11 59 59.03 | 1.9704 | 1 11 4.5 | 15.993 |
| 11 | 10 24 59.64 | 2.1044 | 11 15 50.7 | 15.308 | 11 | 12 1 57.23 | 1.9696 | 1 27 3.6 | 15.978 |
| 12 | 10 27 5.76 | 2.0996 | 11 0 30.8 | 15.354 | 12 | 12 3 55.38 | 1.9688 | 1 43 1.8 | 15.961 |
| 13 | 10 29 11.59 | 2.0947 | 10 45 8.2 | 15.399 | 13 | 12 5 53.49 | 1.9682 | 1 58 58.9 | 15.943 |
| 14 | 10 31 17.13 | 2.0901 | 10 29 42.9 | 15.442 | 14 | 12 7 51.57 | 1.9678 | 2 14 54.9 | 15.923 |
| 15 | 10 33 22.40 | 2.0855 | 10 14 15.1 | 15.483 | 15 | 12 9 49.63 | 1.9675 | 2 30 49.7 | 15.902 |
| 16 | 10 35 27.39 | 2.0809 | 9 58 44.9 | 15.523 | 16 | 12 11 47.67 | 1.9672 | 2 46 43.2 | 15.881 |
| 17 | 10 37 32.11 | 2.0764 | 9 43 12.3 | 15.562 | 17 | 12 13 45.69 | 1.9668 | 3 2 35.4 | 15.858 |
| 18 | 10 39 36.56 | 2.0720 | 9 27 37.5 | 15.598 | 18 | 12 15 43.69 | 1.9666 | 3 18 26.2 | 15.834 |
| 19 | 10 41 40.75 | 2.0677 | 9 12 0.5 | 15.634 | 19 | 12 17 41.68 | 1.9665 | 3 34 15.5 | 15.809 |
| 20 | 10 43 44.69 | 2.0636 | 8 56 21.4 | 15.669 | 20 | 12 19 39.67 | 1.9666 | 3 50 3.3 | 15.783 |
| 21 | 10 45 48.38 | 2.0594 | 8 40 40.2 | 15.702 | 21 | 12 21 37.67 | 1.9667 | 4 5 49.5 | 15.756 |
| 22 | 10 47 51.82 | 2.0554 | 8 24 57.1 | 15.734 | 22 | 12 23 35.67 | 1.9668 | 4 21 34.0 | 15.727 |
| 23 | 10 49 55.03 | 2.0516 | N. 8 9 12.1 | 15.764 | 23 | 12 25 33.68 | 1.9670 | S. 4 37 16.8 | 15.697 |
| | FRIDAY 10. | | | | | SUNDAY 12. | | | |
| 0 | 10 51 58.01 | 2.0477 | N. 7 53 25.4 | 15.792 | 0 | 12 27 31.71 | 1.9673 | S. 4 52 57.7 | 15.666 |
| 1 | 10 54 0.76 | 2.0440 | 7 37 37.0 | 15.820 | 1 | 12 29 29.76 | 1.9677 | 5 8 36.7 | 15.634 |
| 2 | 10 56 3.29 | 2.0403 | 7 21 47.0 | 15.846 | 2 | 12 31 27.83 | 1.9681 | 5 24 13.8 | 15.602 |
| 3 | 10 58 5.60 | 2.0367 | 7 5 55.5 | 15.870 | 3 | 12 33 25.93 | 1.9686 | 5 39 49.0 | 15.568 |
| 4 | 11 0 7.70 | 2.0332 | 6 50 2.6 | 15.893 | 4 | 12 35 24.06 | 1.9692 | 5 55 22.1 | 15.533 |
| 5 | 11 2 9.59 | 2.0298 | 6 34 8.3 | 15.915 | 5 | 12 37 22.23 | 1.9699 | 6 10 53.0 | 15.496 |
| 6 | 11 4 11.28 | 2.0265 | 6 18 12.8 | 15.935 | 6 | 12 39 20.45 | 1.9707 | 6 26 21.6 | 15.458 |
| 7 | 11 6 12.77 | 2.0232 | 6 2 16.1 | 15.954 | 7 | 12 41 18.72 | 1.9715 | 6 41 47.9 | 15.419 |
| 8 | 11 8 14.07 | 2.0202 | 5 46 18.3 | 15.973 | 8 | 12 43 17.03 | 1.9723 | 6 57 11.9 | 15.380 |
| 9 | 11 10 15.19 | 2.0172 | 5 30 19.4 | 15.990 | 9 | 12 45 15.40 | 1.9733 | 7 12 33.5 | 15.339 |
| 10 | 11 12 16.14 | 2.0143 | 5 14 19.5 | 16.005 | 10 | 12 47 13.83 | 1.9744 | 7 27 52.6 | 15.297 |
| 11 | 11 14 16.91 | 2.0114 | 4 58 18.8 | 16.018 | 11 | 12 49 12.32 | 1.9756 | 7 43 9.1 | 15.253 |
| 12 | 11 16 17.51 | 2.0087 | 4 42 17.3 | 16.031 | 12 | 12 51 10.90 | 1.9768 | 7 58 22.9 | 15.208 |
| 13 | 11 18 17.95 | 2.0060 | 4 26 15.1 | 16.042 | 13 | 12 53 9.55 | 1.9781 | 8 13 34.0 | 15.163 |
| 14 | 11 20 18.23 | 2·0034 | 4 10 12.2 | 16.052 | 14 | 12 55 8.27 | 1.9793 | 8 28 42.4 | 15.117 |
| 15 | 11 22 18.36 | 2.0009 | 3 54 8.8 | 16.061 | 15 | 12 57 7.07 | 1.9807 | 8 43 48.0 | 15.069 |
| 16 | 11 24 18.34 | 1.9985 | 3 38 4.9 | 16.068 | 16 | 12 59 5.95 | 1.9821 | 8 58 50.7 | 15.020 |
| 17 | 11 26 18.18 | 1.9962 | 3 22 0.6 | 16.075 | 17 | 13 1 4.92 | 1.9837 | 9 13 50.4 | 14.970 |
| 18 | 11 28 17.89 | 1.9941 | 3 5 55.9 | 16.081 | 18 | 13 3 3.99 | 1.9853 | 9 28 47.1 | 14.919 |
| 19 | 11 30 17.47 | 1.9919 | 2 49 50.9 | 16.085 | 19 | 13 5 3.16 | 1.9870 | 9 43 40.7 | 14.867 |
| 20 | 11 32 16.92 | 1.9898 | 2 33 45.7 | 16.087 | 20 | 13 7 2.43 | 1.9887 | 9 58 31.1 | 14.813 |
| 21 | 11 34 16.25 | 1.9879 | 2 17 40.4 | 16.088 | 21 | 13 9 1.80 | 1.9904 | 10 13 18.3 | 14.759 |
| 22 | 11 36 15.47 | 1.9861 | 2 1 35.1 | 16.088 | 22 | 13 11 1.28 | 1.9923 | 10 28 2.2 | 14.703 |
| 23 | 11 38 14.58 | 1.9842 | 1 45 29.8 | 16.086 | 23 | 13 13 0.88 | 1.9942 | 10 42 42.7 | 14.646 |
| 24 | 11 40 13.58 | 1.9825 | N. 1 29 24.7 | 16.083 | 24 | 13 15 0.59 | 1.9962 | S.10 57 19.7 | 14.588 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### MONDAY 13.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 13 15 0.59 | 1.9962 | S.10 57 19.7 | 14.588 |
| 1 | 13 17 0.42 | 1.9982 | 11 11 53.2 | 14.529 |
| 2 | 13 19 0.38 | 2.0004 | 11 26 23.2 | 14.470 |
| 3 | 13 21 0.47 | 2.0026 | 11 40 49.6 | 14.409 |
| 4 | 13 23 0.69 | 2.0047 | 11 55 12.3 | 14.347 |
| 5 | 13 25 1.04 | 2.0070 | 12 9 31.2 | 14.283 |
| 6 | 13 27 1.53 | 2.0093 | 12 23 46.2 | 14.218 |
| 7 | 13 29 2.16 | 2.0117 | 12 37 57.3 | 14.153 |
| 8 | 13 31 2.94 | 2.0142 | 12 52 4.5 | 14.086 |
| 9 | 13 33 3.86 | 2.0166 | 13 6 7.6 | 14.018 |
| 10 | 13 35 4.93 | 2.0192 | 13 20 6.6 | 13.949 |
| 11 | 13 37 6.16 | 2.0218 | 13 34 1.5 | 13.880 |
| 12 | 13 39 7.55 | 2.0245 | 13 47 52.2 | 13.809 |
| 13 | 13 41 9.10 | 2.0272 | 14 1 38.6 | 13.737 |
| 14 | 13 43 10.81 | 2.0298 | 14 15 20.6 | 13.663 |
| 15 | 13 45 12.68 | 2.0326 | 14 28 58.2 | 13.589 |
| 16 | 13 47 14.72 | 2.0355 | 14 42 31.3 | 13.513 |
| 17 | 13 49 16.94 | 2.0384 | 14 55 59.8 | 13.437 |
| 18 | 13 51 19.33 | 2.0413 | 15 9 23.7 | 13.359 |
| 19 | 13 53 21.90 | 2.0442 | 15 22 42.9 | 13.281 |
| 20 | 13 55 24.64 | 2.0472 | 15 35 57.4 | 13.201 |
| 21 | 13 57 27.57 | 2.0503 | 15 49 7.0 | 13.119 |
| 22 | 13 59 30.68 | 2.0534 | 16 2 11.7 | 13.038 |
| 23 | 14 1 33.98 | 2.0566 | S.16 15 11.5 | 12.956 |

### TUESDAY 14.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 14 3 37.47 | 2.0597 | S.16 28 6.4 | 12.872 |
| 1 | 14 5 41.15 | 2.0629 | 16 40 56.2 | 12.787 |
| 2 | 14 7 45.02 | 2.0661 | 16 53 40.8 | 12.700 |
| 3 | 14 9 49.08 | 2.0693 | 17 6 20.2 | 12.612 |
| 4 | 14 11 53.34 | 2.0727 | 17 18 54.3 | 12.524 |
| 5 | 14 13 57.80 | 2.0760 | 17 31 23.1 | 12.435 |
| 6 | 14 16 2.46 | 2.0793 | 17 43 46.5 | 12.344 |
| 7 | 14 18 7.32 | 2.0827 | 17 56 4.4 | 12.253 |
| 8 | 14 20 12.38 | 2.0861 | 18 8 16.9 | 12.162 |
| 9 | 14 22 17.65 | 2.0895 | 18 20 23.8 | 12.068 |
| 10 | 14 24 23.12 | 2.0929 | 18 32 25.0 | 11.973 |
| 11 | 14 26 28.80 | 2.0964 | 18 44 20.5 | 11.877 |
| 12 | 14 28 34.69 | 2.0999 | 18 56 10.2 | 11.780 |
| 13 | 14 30 40.79 | 2.1034 | 19 7 54.1 | 11.682 |
| 14 | 14 32 47.10 | 2.1069 | 19 19 32.1 | 11.584 |
| 15 | 14 34 53.62 | 2.1104 | 19 31 4.2 | 11.485 |
| 16 | 14 37 0.35 | 2.1140 | 19 42 30.3 | 11.384 |
| 17 | 14 39 7.30 | 2.1176 | 19 53 50.3 | 11.282 |
| 18 | 14 41 14.46 | 2.1212 | 20 5 4.1 | 11.179 |
| 19 | 14 43 21.84 | 2.1247 | 20 16 11.8 | 11.076 |
| 20 | 14 45 29.43 | 2.1282 | 20 27 13.2 | 10.971 |
| 21 | 14 47 37.23 | 2.1318 | 20 38 8.3 | 10.865 |
| 22 | 14 49 45.25 | 2.1355 | 20 48 57.0 | 10.758 |
| 23 | 14 51 53.49 | 2.1391 | 20 59 39.3 | 10.651 |
| 24 | 14 54 1.94 | 2.1427 | S.21 10 15.1 | 10.542 |

### WEDNESDAY 15.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 14 54 1.94 | 2.1427 | S.21 10 15.1 | 10.542 |
| 1 | 14 56 10.61 | 2.1462 | 21 20 44.4 | 10.433 |
| 2 | 14 58 19.49 | 2.1498 | 21 31 7.1 | 10.322 |
| 3 | 15 0 28.59 | 2.1534 | 21 41 23.1 | 10.211 |
| 4 | 15 2 37.90 | 2.1569 | 21 51 32.4 | 10.099 |
| 5 | 15 4 47.42 | 2.1605 | 22 1 35.0 | 9.987 |
| 6 | 15 6 57.16 | 2.1641 | 22 11 30.8 | 9.873 |
| 7 | 15 9 7.11 | 2.1676 | 22 21 19.7 | 9.757 |
| 8 | 15 11 17.27 | 2.1712 | 22 31 1.6 | 9.640 |
| 9 | 15 13 27.65 | 2.1747 | 22 40 36.5 | 9.523 |
| 10 | 15 15 38.24 | 2.1782 | 22 50 4.4 | 9.406 |
| 11 | 15 17 49.03 | 2.1816 | 22 59 25.2 | 9.287 |
| 12 | 15 20 0.03 | 2.1851 | 23 8 38.9 | 9.168 |
| 13 | 15 22 11.24 | 2.1885 | 23 17 45.4 | 9.048 |
| 14 | 15 24 22.65 | 2.1919 | 23 26 44.7 | 8.927 |
| 15 | 15 26 34.27 | 2.1953 | 23 35 36.7 | 8.805 |
| 16 | 15 28 46.09 | 2.1987 | 23 44 21.3 | 8.682 |
| 17 | 15 30 58.11 | 2.2020 | 23 52 58.5 | 8.558 |
| 18 | 15 33 10.33 | 2.2052 | 24 1 28.2 | 8.433 |
| 19 | 15 35 22.74 | 2.2084 | 24 9 50.5 | 8.309 |
| 20 | 15 37 35.34 | 2.2116 | 24 18 5.3 | 8.183 |
| 21 | 15 39 48.13 | 2.2148 | 24 26 12.5 | 8.057 |
| 22 | 15 42 1.11 | 2.2179 | 24 34 12.1 | 7.929 |
| 23 | 15 44 14.28 | 2.2211 | S.24 42 4.0 | 7.800 |

### THURSDAY 16.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 15 46 27.64 | 2.2242 | S.24 49 48.1 | 7.671 |
| 1 | 15 48 41.18 | 2.2272 | 24 57 24.5 | 7.542 |
| 2 | 15 50 54.90 | 2.2301 | 25 4 53.1 | 7.412 |
| 3 | 15 53 8.79 | 2.2329 | 25 12 13.9 | 7.281 |
| 4 | 15 55 22.85 | 2.2357 | 25 19 26.8 | 7.149 |
| 5 | 15 57 37.08 | 2.2386 | 25 26 31.8 | 7.017 |
| 6 | 15 59 51.48 | 2.2413 | 25 33 28.9 | 6.885 |
| 7 | 16 2 6.04 | 2.2440 | 25 40 18.0 | 6.751 |
| 8 | 16 4 20.76 | 2.2467 | 25 46 59.0 | 6.616 |
| 9 | 16 6 35.64 | 2.2492 | 25 53 31.9 | 6.481 |
| 10 | 16 8 50.67 | 2.2517 | 25 59 56.7 | 6.346 |
| 11 | 16 11 5.85 | 2.2542 | 26 6 13.4 | 6.210 |
| 12 | 16 13 21.18 | 2.2567 | 26 12 21.9 | 6.073 |
| 13 | 16 15 36.65 | 2.2589 | 26 18 22.2 | 5.936 |
| 14 | 16 17 52.25 | 2.2612 | 26 24 14.2 | 5.799 |
| 15 | 16 20 7.99 | 2.2634 | 26 29 58.0 | 5.662 |
| 16 | 16 22 23.86 | 2.2656 | 26 35 33.6 | 5.524 |
| 17 | 16 24 39.86 | 2.2677 | 26 41 0.9 | 5.385 |
| 18 | 16 26 55.98 | 2.2696 | 26 46 19.8 | 5.245 |
| 19 | 16 29 12.21 | 2.2714 | 26 51 30.3 | 5.105 |
| 20 | 16 31 28.55 | 2.2732 | 26 56 32.4 | 4.965 |
| 21 | 16 33 45.00 | 2.2750 | 27 1 26.1 | 4.824 |
| 22 | 16 36 1.55 | 2.2767 | 27 6 11.3 | 4.683 |
| 23 | 16 38 18.20 | 2.2783 | 27 10 48.1 | 4.541 |
| 24 | 16 40 34.95 | 2.2799 | S.27 15 16.3 | 4.399 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | FRIDAY 17. | | | | | SUNDAY 19. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 16 40 34.95 | 2.2799 | S.27 15 16.3 | 4.399 | 0 | 18 30 4.95 | 2.2484 | S.28 1 9.4 | 2.443 |
| 1 | 16 42 51.79 | 2.2813 | 27 19 36.0 | 4.258 | 1 | 18 32 19.77 | 2.2456 | 27 58 38.7 | 2.579 |
| 2 | 16 45 8.71 | 2.2826 | 27 23 47.2 | 4.116 | 2 | 18 34 34.42 | 2.2428 | 27 55 59.9 | 2.715 |
| 3 | 16 47 25.70 | 2.2838 | 27 27 49.9 | 3.973 | 3 | 18 36 48.90 | 2.2399 | 27 53 12.9 | 2.851 |
| 4 | 16 49 42.77 | 2.2851 | 27 31 44.0 | 3.831 | 4 | 18 39 3.21 | 2.2370 | 27 50 17.8 | 2.985 |
| 5 | 16 51 59.91 | 2.2862 | 27 35 29.6 | 3.687 | 5 | 18 41 17.34 | 2.2339 | 27 47 14.7 | 3.118 |
| 6 | 16 54 17.11 | 2.2872 | 27 39 6.5 | 3.543 | 6 | 18 43 31.28 | 2.2308 | 27 44 3.6 | 3.252 |
| 7 | 16 56 34.37 | 2.2881 | 27 42 34.8 | 3.400 | 7 | 18 45 45.03 | 2.2276 | 27 40 44.5 | 3.385 |
| 8 | 16 58 51.68 | 2.2889 | 27 45 54.5 | 3.257 | 8 | 18 47 58.59 | 2.2243 | 27 37 17.4 | 3.517 |
| 9 | 17 1 9.04 | 2.2897 | 27 49 5.6 | 3.113 | 9 | 18 50 11.95 | 2.2210 | 27 33 42.4 | 3.649 |
| 10 | 17 3 26.44 | 2.2903 | 27 52 8.0 | 2.968 | 10 | 18 52 25.11 | 2.2177 | 27 29 59.5 | 3.780 |
| 11 | 17 5 43.88 | 2.2909 | 27 55 1.8 | 2.824 | 11 | 18 54 38.07 | 2.2143 | 27 26 8.8 | 3.911 |
| 12 | 17 8 1.35 | 2.2914 | 27 57 46.9 | 2.679 | 12 | 18 56 50.83 | 2.2109 | 27 22 10.2 | 4.042 |
| 13 | 17 10 18.85 | 2.2918 | 28 0 23.3 | 2.535 | 13 | 18 59 3.38 | 2.2073 | 27 18 3.8 | 4.171 |
| 14 | 17 12 36.37 | 2.2921 | 28 2 51.1 | 2.391 | 14 | 19 1 15.71 | 2.2037 | 27 13 49.7 | 4.298 |
| 15 | 17 14 53.90 | 2.2922 | 28 5 10.2 | 2.246 | 15 | 19 3 27.83 | 2.2001 | 27 9 28.0 | 4.425 |
| 16 | 17 17 11.44 | 2.2923 | 28 7 20.6 | 2.101 | 16 | 19 5 39.73 | 2.1964 | 27 4 58.7 | 4.552 |
| 17 | 17 19 28.98 | 2.2923 | 28 9 22.3 | 1.957 | 17 | 19 7 51.40 | 2.1927 | 27 0 21.8 | 4.678 |
| 18 | 17 21 46.52 | 2.2923 | 28 11 15.4 | 1.812 | 18 | 19 10 2.85 | 2.1889 | 26 55 37.3 | 4.805 |
| 19 | 17 24 4.06 | 2.2922 | 28 12 59.8 | 1.667 | 19 | 19 12 14.07 | 2.1851 | 26 50 45.2 | 4.931 |
| 20 | 17 26 21.59 | 2.2919 | 28 14 35.5 | 1.522 | 20 | 19 14 25.06 | 2.1812 | 26 45 45.6 | 5.055 |
| 21 | 17 28 39.09 | 2.2915 | 28 16 2.5 | 1.377 | 21 | 19 16 35.82 | 2.1773 | 26 40 38.6 | 5.178 |
| 22 | 17 30 56.57 | 2.2911 | 28 17 20.8 | 1.233 | 22 | 19 18 46.34 | 2.1734 | 26 35 24.2 | 5.301 |
| 23 | 17 33 14.02 | 2.2906 | S.28 18 30.5 | 1.089 | 23 | 19 20 56.63 | 2.1695 | S.26 30 2.4 | 5.424 |
| | SATURDAY 18. | | | | | MONDAY 20. | | | |
| 0 | 17 35 31.44 | 2.2900 | S.28 19 31.5 | 0.944 | 0 | 19 23 6.68 | 2.1654 | S.26 24 33.3 | 5.546 |
| 1 | 17 37 48.82 | 2.2892 | 28 20 23.8 | 0.800 | 1 | 19 25 16.48 | 2.1613 | 26 18 56.9 | 5.667 |
| 2 | 17 40 6.15 | 2.2884 | 28 21 7.5 | 0.656 | 2 | 19 27 26.04 | 2.1573 | 26 13 13.3 | 5.786 |
| 3 | 17 42 23.43 | 2.2876 | 28 21 42.5 | 0.512 | 3 | 19 29 35.36 | 2.1532 | 26 7 22.6 | 5.904 |
| 4 | 17 44 40.66 | 2.2866 | 28 22 8.9 | 0.368 | 4 | 19 31 44.43 | 2 1491 | 26 1 24.8 | 6.022 |
| 5 | 17 46 57.82 | 2.2854 | 28 22 26.7 | 0.225 | 5 | 19 33 53.25 | 2.1449 | 25 55 19.9 | 6.14. |
| 6 | 17 49 14.91 | 2.2842 | 28 22 35.9 | –0.082 | 6 | 19 36 1.81 | 2.1406 | 25 49 7.9 | 6.259 |
| 7 | 17 51 31.92 | 2.2829 | 28 22 36.5 | +0.062 | 7 | 19 38 10.12 | 2.1364 | 25 42 48.8 | 6.376 |
| 8 | 17 53 48.86 | 2.2817 | 28 22 28.5 | 0.205 | 8 | 19 40 18.18 | 2.1322 | 25 36 22.8 | 6.490 |
| 9 | 17 56 5.72 | 2.2802 | 28 22 11.9 | 0.347 | 9 | 19 42 25.98 | 2.1279 | 25 29 50.0 | 6.604 |
| 10 | 17 58 22.49 | 2.2787 | 28 21 46.8 | 0.489 | 10 | 19 44 33.53 | 2.1236 | 25 23 10.3 | 6.718 |
| 11 | 18 0 39.16 | 2.2770 | 28 21 13.2 | 0.631 | 11 | 19 46 40.82 | 2.1193 | 25 16 23.8 | 6.832 |
| 12 | 18 2 55.73 | 2.2753 | 28 20 31.1 | 0.772 | 12 | 19 48 47.85 | 2.1150 | 25 9 30.5 | 6.944 |
| 13 | 18 5 12.20 | 2.2736 | 28 19 40.5 | 0.914 | 13 | 19 50 54.62 | 2.1107 | 25 2 30.5 | 7.055 |
| 14 | 18 7 28.56 | 2.2717 | 28 18 41.4 | 1.056 | 14 | 19 53 1.13 | 2.1064 | 24 55 23.9 | 7.166 |
| 15 | 18 9 44.80 | 2.2697 | 28 17 33.8 | 1.197 | 15 | 19 55 7.39 | 2.1021 | 24 48 10.6 | 7.277 |
| 16 | 18 12 0.92 | 2.2676 | 28 16 17.8 | 1.337 | 16 | 19 57 13.38 | 2.0977 | 24 40 50.7 | 7.386 |
| 17 | 18 14 16.91 | 2.2654 | 28 14 53.4 | 1.477 | 17 | 19 59 19.11 | 2.0932 | 24 33 24.3 | 7.493 |
| 18 | 18 16 32.77 | 2.2632 | 28 13 20.6 | 1.616 | 18 | 20 1 24.57 | 2.0888 | 24 25 51.5 | 7.600 |
| 19 | 18 18 48.50 | 2.2610 | 28 11 39.5 | 1.755 | 19 | 20 3 29.77 | 2.0845 | 24 18 12.3 | 7.707 |
| 20 | 18 21 4.09 | 2.2586 | 28 9 50.0 | 1.894 | 20 | 20 5 34.71 | 2.0802 | 24 10 26.6 | 7.814 |
| 21 | 18 23 19.53 | 2.2561 | 28 7 52.2 | 2.032 | 21 | 20 7 39.39 | 2.0758 | 24 2 34.6 | 7.919 |
| 22 | 18 25 34.82 | 2.2536 | 28 5 46.2 | 2.169 | 22 | 20 9 43.81 | 2.0714 | 23 54 36.3 | 8.023 |
| 23 | 18 27 49.96 | 2.2511 | 28 3 31.9 | 2.307 | 23 | 20 11 47.96 | 2.0670 | 23 46 31.8 | 8.127 |
| 24 | 18 30 4.95 | 2.2484 | S.28 1 9.4 | 2.443 | 24 | 20 13 51.85 | 2.0627 | S.23 38 21.1 | 8.230 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | TUESDAY 21. | | | | | THURSDAY 23. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 20 13 51.85 | 2.0627 | S. 23 38 21.1 | 8.230 | 0 | 21 48 15.41 | 1.8845 | S. 15 19 51.2 | 12.249 |
| 1 | 20 15 55.48 | 2.0583 | 23 30 4.2 | 8.332 | 1 | 21 50 8.40 | 1.8818 | 15 7 34.3 | 12.315 |
| 2 | 20 17 58.85 | 2.0540 | 23 21 41.2 | 8.433 | 2 | 21 52 1.23 | 1.8792 | 14 55 13.4 | 12.381 |
| 3 | 20 20 1.96 | 2.0496 | 23 13 12.2 | 8.533 | 3 | 21 53 53.91 | 1.8767 | 14 42 48.6 | 12.446 |
| 4 | 20 22 4.80 | 2.0453 | 23 4 37.3 | 8.632 | 4 | 21 55 46.44 | 1.8743 | 14 30 19.9 | 12.510 |
| 5 | 20 24 7.39 | 2.0410 | 22 55 56.4 | 8.731 | 5 | 21 57 38.83 | 1.8719 | 14 17 47.4 | 12.572 |
| 6 | 20 26 9.72 | 2.0367 | 22 47 9.6 | 8.829 | 6 | 21 59 31.07 | 1.8695 | 14 5 11.2 | 12.634 |
| 7 | 20 28 11.79 | 2.0324 | 22 38 16.9 | 8.927 | 7 | 22 1 23.17 | 1.8673 | 13 52 31.3 | 12.696 |
| 8 | 20 30 13.60 | 2.0281 | 22 29 18.4 | 9.023 | 8 | 22 3 15.14 | 1.8652 | 13 39 47.7 | 12.757 |
| 9 | 20 32 15.16 | 2.0238 | 22 20 14.1 | 9.119 | 9 | 22 5 6.99 | 1.8632 | 13 27 0.5 | 12.817 |
| 10 | 20 34 16.46 | 2.0196 | 22 11 4.1 | 9.213 | 10 | 22 6 58.72 | 1.8611 | 13 14 9.7 | 12.877 |
| 11 | 20 36 17.51 | 2.0153 | 22 1 48.5 | 9.307 | 11 | 22 8 50.32 | 1.8590 | 13 1 15.3 | 12.936 |
| 12 | 20 38 18.30 | 2.0111 | 21 52 27.3 | 9.400 | 12 | 22 10 41.80 | 1.8571 | 12 48 17.4 | 12.994 |
| 13 | 20 40 18.84 | 2.0069 | 21 43 0.5 | 9.493 | 13 | 22 12 33.17 | 1.8552 | 12 35 16.0 | 13.052 |
| 14 | 20 42 19.13 | 2.0028 | 21 33 28.1 | 9.585 | 14 | 22 14 24.43 | 1.8534 | 12 22 11.2 | 13.108 |
| 15 | 20 44 19.18 | 1.9987 | 21 23 50.3 | 9.675 | 15 | 22 16 15.58 | 1.8517 | 12 9 3.0 | 13.164 |
| 16 | 20 46 18.98 | 1.9947 | 21 14 7.1 | 9.765 | 16 | 22 18 6.63 | 1.8500 | 11 55 51.5 | 13.219 |
| 17 | 20 48 18.54 | 1.9906 | 21 4 18.5 | 9.855 | 17 | 22 19 57.58 | 1.8484 | 11 42 36.7 | 13.274 |
| 18 | 20 50 17.85 | 1.9865 | 20 54 24.5 | 9.943 | 18 | 22 21 48.44 | 1.8469 | 11 29 18.6 | 13.328 |
| 19 | 20 52 16.92 | 1.9825 | 20 44 25.3 | 10.031 | 19 | 22 23 39.21 | 1.8454 | 11 15 57.3 | 13.382 |
| 20 | 20 54 15.75 | 1.9785 | 20 34 20.8 | 10.118 | 20 | 22 25 29.89 | 1.8440 | 11 2 32.8 | 13.435 |
| 21 | 20 56 14.34 | 1.9746 | 20 24 11.1 | 10.204 | 21 | 22 27 20.49 | 1.8428 | 10 49 5.1 | 13.487 |
| 22 | 20 58 12.70 | 1.9707 | 20 13 56.3 | 10.289 | 22 | 22 29 11.02 | 1.8416 | 10 35 34.3 | 13.539 |
| 23 | 21 0 10.82 | 1.9668 | S. 20 3 36.4 | 10.374 | 23 | 22 31 1.48 | 1.8403 | S. 10 22 0.4 | 13.589 |
| | WEDNESDAY 22. | | | | | FRIDAY 24. | | | |
| 0 | 21 2 8.71 | 1.9629 | S. 19 53 11.4 | 10.458 | 0 | 22 32 51.86 | 1.8391 | S. 10 8 23.6 | 13.638 |
| 1 | 21 4 6.37 | 1.9592 | 19 42 41.4 | 10.541 | 1 | 22 34 42.17 | 1.8381 | 9 54 43.8 | 13.688 |
| 2 | 21 6 3.81 | 1.9554 | 19 32 6.5 | 10.624 | 2 | 22 36 32.43 | 1.8372 | 9 41 1.0 | 13.737 |
| 3 | 21 8 1.02 | 1.9517 | 19 21 26.6 | 10.706 | 3 | 22 38 22.64 | 1.8364 | 9 27 15.3 | 13.786 |
| 4 | 21 9 58.01 | 1.9480 | 19 10 41.8 | 10.787 | 4 | 22 40 12.80 | 1.8356 | 9 13 26.7 | 13.834 |
| 5 | 21 11 54.78 | 1.9443 | 18 59 52.2 | 10.866 | 5 | 22 42 2.91 | 1.8348 | 8 59 35.2 | 13.881 |
| 6 | 21 13 51.33 | 1.9407 | 18 48 57.0 | 10.945 | 6 | 22 43 52.98 | 1.8342 | 8 45 41.0 | 13.926 |
| 7 | 21 15 47.66 | 1.9371 | 18 37 58.8 | 11.024 | 7 | 22 45 43.01 | 1.8336 | 8 31 44.1 | 13.971 |
| 8 | 21 17 43.78 | 1.9337 | 18 26 55.0 | 11.102 | 8 | 22 47 33.01 | 1.8331 | 8 17 44.5 | 14.016 |
| 9 | 21 19 39.70 | 1.9303 | 18 15 46.5 | 11.180 | 9 | 22 49 22.98 | 1.8326 | 8 3 42.2 | 14.060 |
| 10 | 21 21 35.42 | 1.9269 | 18 4 33.4 | 11.256 | 10 | 22 51 12.92 | 1.8322 | 7 49 37.3 | 14.103 |
| 11 | 21 23 30.93 | 1.9235 | 17 53 15.8 | 11.331 | 11 | 22 53 2.84 | 1.8319 | 7 35 29.8 | 14.146 |
| 12 | 21 25 26.24 | 1.9202 | 17 41 53.7 | 11.406 | 12 | 22 54 52.75 | 1.8317 | 7 21 19.8 | 14.188 |
| 13 | 21 27 21.35 | 1.9169 | 17 30 27.1 | 11.481 | 13 | 22 56 42.65 | 1.8316 | 7 7 7.3 | 14.229 |
| 14 | 21 29 16.27 | 1.9136 | 17 18 56.0 | 11.555 | 14 | 22 58 32.54 | 1.8315 | 6 52 52.3 | 14.270 |
| 15 | 21 31 10.99 | 1.9104 | 17 7 20.5 | 11.627 | 15 | 23 0 22.43 | 1.8316 | 6 38 34.9 | 14.310 |
| 16 | 21 33 5.52 | 1.9073 | 16 55 40.7 | 11.699 | 16 | 23 2 12.33 | 1.8317 | 6 24 15.1 | 14.349 |
| 17 | 21 34 59.87 | 1.9043 | 16 43 56.6 | 11.770 | 17 | 23 4 2.24 | 1.8318 | 6 9 53.0 | 14.387 |
| 18 | 21 36 54.04 | 1.9013 | 16 32 8.3 | 11.840 | 18 | 23 5 52.15 | 1.8320 | 5 55 28.7 | 14.424 |
| 19 | 21 38 48.03 | 1.8983 | 16 20 15.8 | 11.910 | 19 | 23 7 42.08 | 1.8324 | 5 41 2.1 | 14.461 |
| 20 | 21 40 41.84 | 1.8954 | 16 8 19.1 | 11.980 | 20 | 23 9 32.04 | 1.8329 | 5 26 33.3 | 14.498 |
| 21 | 21 42 35.48 | 1.8926 | 15 56 18.2 | 12.049 | 21 | 23 11 22.03 | 1.8334 | 5 12 2.3 | 14.534 |
| 22 | 21 44 28.95 | 1.8899 | 15 44 13.2 | 12.117 | 22 | 23 13 12.05 | 1.8340 | 4 57 29.2 | 14.569 |
| 23 | 21 46 22.26 | 1.8872 | 15 32 4.2 | 12.183 | 23 | 23 15 2.11 | 1.8346 | 4 42 54.0 | 14.603 |
| 24 | 21 48 15.41 | 1.8845 | S. 15 19 51.2 | 12.249 | 24 | 23 16 52.21 | 1.8353 | S. 4 28 16.8 | 14.637 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SATURDAY 25.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
|  | h m s | s | ° ′ ″ | ″ |
| 0 | 23 16 52.21 | 1.8353 | S. 4 28 16.8 | 14.637 |
| 1 | 23 18 42.35 | 1.8362 | 4 13 37.6 | 14.669 |
| 2 | 23 20 32.55 | 1.8372 | 3 58 56.5 | 14.701 |
| 3 | 23 22 22.81 | 1.8382 | 3 44 13.5 | 14.732 |
| 4 | 23 24 13.13 | 1.8392 | 3 29 28.7 | 14.762 |
| 5 | 23 26 3.51 | 1.8404 | 3 14 42.1 | 14.792 |
| 6 | 23 27 53.97 | 1.8417 | 2 59 53.7 | 14.821 |
| 7 | 23 29 44.51 | 1.8430 | 2 45 3.6 | 14.849 |
| 8 | 23 31 35.13 | 1.8443 | 2 30 11.8 | 14.877 |
| 9 | 23 33 25.83 | 1.8457 | 2 15 18.4 | 14.903 |
| 10 | 23 35 16.62 | 1.8473 | 2 0 23.5 | 14.928 |
| 11 | 23 37 7.51 | 1.8491 | 1 45 27.1 | 14.953 |
| 12 | 23 38 58.51 | 1.8509 | 1 30 29.2 | 14.978 |
| 13 | 23 40 49.62 | 1.8527 | 1 15 29.8 | 15.001 |
| 14 | 23 42 40.84 | 1.8546 | 1 0 29.1 | 15.023 |
| 15 | 23 44 32.17 | 1.8565 | 0 45 27.1 | 15.044 |
| 16 | 23 46 23.62 | 1.8586 | 0 30 23.8 | 15.065 |
| 17 | 23 48 15.20 | 1.8608 | 0 15 19.3 | 15.085 |
| 18 | 23 50 6.91 | 1.8631 | S. 0 0 13.6 | 15.104 |
| 19 | 23 51 58.77 | 1.8656 | N. 0 14 53.2 | 15.122 |
| 20 | 23 53 50.78 | 1.8681 | 0 30 1.1 | 15.140 |
| 21 | 23 55 42.94 | 1.8706 | 0 45 10.0 | 15.156 |
| 22 | 23 57 35.25 | 1.8732 | 1 0 19.8 | 15.171 |
| 23 | 23 59 27.72 | 1.8759 | N. 1 15 30.5 | 15.186 |

### SUNDAY 26.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 0 1 20.35 | 1.8787 | N. 1 30 42.1 | 15.200 |
| 1 | 0 3 13.16 | 1.8816 | 1 45 54.5 | 15.212 |
| 2 | 0 5 6.14 | 1.8845 | 2 1 7.6 | 15.224 |
| 3 | 0 6 59.30 | 1.8876 | 2 16 21.4 | 15.235 |
| 4 | 0 8 52.65 | 1.8908 | 2 31 35.8 | 15.245 |
| 5 | 0 10 46.20 | 1.8941 | 2 46 50.8 | 15.254 |
| 6 | 0 12 39.95 | 1.8975 | 3 2 6.3 | 15.262 |
| 7 | 0 14 33.90 | 1.9009 | 3 17 22.2 | 15.268 |
| 8 | 0 16 28.06 | 1.9044 | 3 32 38.5 | 15.275 |
| 9 | 0 18 22.43 | 1.9080 | 3 47 55.2 | 15.280 |
| 10 | 0 20 17.02 | 1.9118 | 4 3 12.1 | 15.284 |
| 11 | 0 22 11.84 | 1.9157 | 4 18 29.2 | 15.287 |
| 12 | 0 24 6.90 | 1.9196 | 4 33 46.5 | 15.288 |
| 13 | 0 26 2.19 | 1.9235 | 4 49 3.8 | 15.288 |
| 14 | 0 27 57.72 | 1.9276 | 5 4 21.1 | 15.288 |
| 15 | 0 29 53.50 | 1.9318 | 5 19 38.4 | 15.287 |
| 16 | 0 31 49.54 | 1.9361 | 5 34 55.6 | 15.285 |
| 17 | 0 33 45.84 | 1.9405 | 5 50 12.6 | 15.281 |
| 18 | 0 35 42.40 | 1.9449 | 6 5 29.3 | 15.276 |
| 19 | 0 37 39.23 | 1.9495 | 6 20 45.7 | 15.270 |
| 20 | 0 39 36.34 | 1.9542 | 6 36 1.7 | 15.263 |
| 21 | 0 41 33.74 | 1.9590 | 6 51 17.3 | 15.255 |
| 22 | 0 43 31.42 | 1.9638 | 7 6 32.3 | 15.244 |
| 23 | 0 45 29.39 | 1.9687 | 7 21 46.6 | 15.233 |
| 24 | 0 47 27.66 | 1.9738 | N. 7 37 0.2 | 15.221 |

### MONDAY 27.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
|  | h m s | s | ° ′ ″ | ″ |
| 0 | 0 47 27.66 | 1.9738 | N. 7 37 0.2 | 15.221 |
| 1 | 0 49 26.24 | 1.9789 | 7 52 13.1 | 15.208 |
| 2 | 0 51 25.13 | 1.9841 | 8 7 25.1 | 15.193 |
| 3 | 0 53 24.33 | 1.9893 | 8 22 36.2 | 15.178 |
| 4 | 0 55 23.85 | 1.9947 | 8 37 46.4 | 15.162 |
| 5 | 0 57 23.70 | 2.0003 | 8 52 55.6 | 15.143 |
| 6 | 0 59 23.89 | 2.0060 | 9 8 3.6 | 15.123 |
| 7 | 1 1 24.42 | 2.0117 | 9 23 10.4 | 15.102 |
| 8 | 1 3 25.29 | 2.0174 | 9 38 15.8 | 15.078 |
| 9 | 1 5 26.51 | 2.0232 | 9 53 19.8 | 15.054 |
| 10 | 1 7 28.08 | 2.0292 | 10 8 22.3 | 15.029 |
| 11 | 1 9 30.01 | 2.0352 | 10 23 23.3 | 15.002 |
| 12 | 1 11 32.31 | 2.0414 | 10 38 22.6 | 14.974 |
| 13 | 1 13 34.98 | 2.0477 | 10 53 20.2 | 14.945 |
| 14 | 1 15 38.03 | 2.0540 | 11 8 16.0 | 14.913 |
| 15 | 1 17 41.46 | 2.0604 | 11 23 9.8 | 14.880 |
| 16 | 1 19 45.28 | 2.0669 | 11 38 1.6 | 14.847 |
| 17 | 1 21 49.49 | 2.0735 | 11 52 51.4 | 14.812 |
| 18 | 1 23 54.10 | 2.0803 | 12 7 39.0 | 14.774 |
| 19 | 1 25 59.12 | 2.0871 | 12 22 24.3 | 14.735 |
| 20 | 1 28 4.55 | 2.0939 | 12 37 7.2 | 14.695 |
| 21 | 1 30 10.39 | 2.1008 | 12 51 47.7 | 14.653 |
| 22 | 1 32 16.65 | 2.1079 | 13 6 25.6 | 14.609 |
| 23 | 1 34 23.34 | 2.1151 | N.13 21 0.8 | 14.564 |

### TUESDAY 28.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 1 36 30.46 | 2.1223 | N.13 35 33.3 | 14.517 |
| 1 | 1 38 38.02 | 2.1296 | 13 50 2.9 | 14.468 |
| 2 | 1 40 46.01 | 2.1369 | 14 4 29.5 | 14.418 |
| 3 | 1 42 54.44 | 2.1444 | 14 18 53.1 | 14.367 |
| 4 | 1 45 3.33 | 2.1520 | 14 33 13.5 | 14.313 |
| 5 | 1 47 12.68 | 2.1597 | 14 47 30.6 | 14.258 |
| 6 | 1 49 22.49 | 2.1673 | 15 1 44.4 | 14.201 |
| 7 | 1 51 32.76 | 2.1751 | 15 15 54.7 | 14.141 |
| 8 | 1 53 43.50 | 2.1829 | 15 30 1.3 | 14.079 |
| 9 | 1 55 54.71 | 2.1908 | 15 44 4.2 | 14.016 |
| 10 | 1 58 6.40 | 2.1989 | 15 58 3.2 | 13.951 |
| 11 | 2 0 18.58 | 2.2070 | 16 11 58.3 | 13.885 |
| 12 | 2 2 31.24 | 2.2151 | 16 25 49.4 | 13.817 |
| 13 | 2 4 44.39 | 2.2233 | 16 39 36.3 | 13.747 |
| 14 | 2 6 58.03 | 2.2316 | 16 53 19.0 | 13.675 |
| 15 | 2 9 12.18 | 2.2400 | 17 6 57.3 | 13.601 |
| 16 | 2 11 26.83 | 2.2484 | 17 20 31.1 | 13.525 |
| 17 | 2 13 41.99 | 2.2569 | 17 34 0.3 | 13.447 |
| 18 | 2 15 57.66 | 2.2654 | 17 47 24.7 | 13.367 |
| 19 | 2 18 13.84 | 2.2740 | 18 0 44.3 | 13.285 |
| 20 | 2 20 30.54 | 2.2827 | 18 13 58.9 | 13.201 |
| 21 | 2 22 47.77 | 2.2915 | 18 27 8.4 | 13.115 |
| 22 | 2 25 5.52 | 2.3002 | 18 40 12.7 | 13.027 |
| 23 | 2 27 23.79 | 2.3089 | 18 53 11.7 | 12.937 |
| 24 | 2 29 42.59 | 2.3177 | N.19 6 5.2 | 12.845 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| WEDNESDAY 29. | | | | | THURSDAY 30. | | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 2 29 42.59 | 2.3177 | N.19 6 5.2 | 12.845 | 0 | 3 27 56.99 | 2.5358 | N.23 42 33.2 | 9.983 |
| 1 | 2 32 1.92 | 2.3267 | 19 18 53.1 | 12.751 | 1 | 3 30 29.41 | 2.5448 | 23 52 27.8 | 9.836 |
| 2 | 2 34 21.79 | 2.3357 | 19 31 35.3 | 12.654 | 2 | 3 33 2.37 | 2.5537 | 24 2 13.5 | 9.687 |
| 3 | 2 36 42.20 | 2.3447 | 19 44 11.6 | 12.556 | 3 | 3 35 35.86 | 2.5626 | 24 11 50.2 | 9.536 |
| 4 | 2 39 3.15 | 2.3537 | 19 56 42.0 | 12.456 | 4 | 3 38 9.88 | 2.5713 | 24 21 17.8 | 9.383 |
| 5 | 2 41 24.64 | 2.3627 | 20 9 6.3 | 12.353 | 5 | 3 40 44.42 | 2.5800 | 24 30 36.2 | 9.228 |
| 6 | 2 43 46.67 | 2.3717 | 20 21 24.3 | 12.248 | 6 | 3 43 19.48 | 2.5887 | 24 39 45.2 | 9.070 |
| 7 | 2 46 9.25 | 2.3808 | 20 33 36.0 | 12.141 | 7 | 3 45 55.06 | 2.5972 | 24 48 44.6 | 8.910 |
| 8 | 2 48 32.37 | 2.3899 | 20 45 41.2 | 12.031 | 8 | 3 48 31.15 | 2.6057 | 24 57 34.4 | 8.748 |
| 9 | 2 50 56.04 | 2.3991 | 20 57 39.7 | 11.919 | 9 | 3 51 7.74 | 2.6140 | 25 6 14.4 | 8.584 |
| 10 | 2 53 20.26 | 2.4082 | 21 9 31.5 | 11.806 | 10 | 3 53 44.83 | 2.6223 | 25 14 44.5 | 8.418 |
| 11 | 2 55 45.03 | 2.4173 | 21 21 16.4 | 11.689 | 11 | 3 56 22.42 | 2.6306 | 25 23 4.6 | 8.251 |
| 12 | 2 58 10.34 | 2.4265 | 21 32 54.2 | 11.571 | 12 | 3 59 0.50 | 2.6387 | 25 31 14.6 | 8.081 |
| 13 | 3 0 36.21 | 2.4357 | 21 44 24.9 | 11.451 | 13 | 4 1 39.07 | 2.6467 | 25 39 14.3 | 7.908 |
| 14 | 3 3 2.63 | 2.4449 | 21 55 48.3 | 11.329 | 14 | 4 4 18.11 | 2.6546 | 25 47 3.6 | 7.734 |
| 15 | 3 5 29.60 | 2.4541 | 22 7 4.4 | 11.205 | 15 | 4 6 57.62 | 2.6624 | 25 54 42.4 | 7.558 |
| 16 | 3 7 57.12 | 2.4632 | 22 18 12.9 | 11.077 | 16 | 4 9 37.60 | 2.6701 | 26 2 10.6 | 7.380 |
| 17 | 3 10 25.19 | 2.4724 | 22 29 13.7 | 10.948 | 17 | 4 12 18.03 | 2.6776 | 26 9 28.0 | 7.200 |
| 18 | 3 12 53.81 | 2.4816 | 22 40 6.7 | 10.817 | 18 | 4 14 58.91 | 2.6850 | 26 16 34.6 | 7.018 |
| 19 | 3 15 22.98 | 2.4907 | 22 50 51.8 | 10.683 | 19 | 4 17 40.23 | 2.6922 | 26 23 30.2 | 6.834 |
| 20 | 3 17 52.69 | 2.4998 | 23 1 28.8 | 10.548 | 20 | 4 20 21.98 | 2.6994 | 26 30 14.7 | 6.649 |
| 21 | 3 20 22.95 | 2.5089 | 23 11 57.6 | 10.410 | 21 | 4 23 4.16 | 2.7065 | 26 36 48.1 | 6.462 |
| 22 | 3 22 53.76 | 2.5180 | 23 22 18.0 | 10.269 | 22 | 4 25 46.76 | 2.7133 | 26 43 10.2 | 6.273 |
| 23 | 3 25 25.11 | 2.5269 | 23 32 29.9 | 10.127 | 23 | 4 28 29.76 | 2.7199 | 26 49 20.9 | 6.082 |
| 24 | 3 27 56.99 | 2.5358 | N.23 42 33.2 | 9.983 | 24 | 4 31 13.15 | 2.7264 | N.26 55 20.1 | 5.890 |

## PHASES OF THE MOON.

| | d | h | m |
|---|---|---|---|
| ○ Full Moon, . . . . . . . . . . | 1 | 11 | 30.9 |
| ☾ Last Quarter, . . . . . . . . . . | 8 | 5 | 17.4 |
| ● New Moon, . . . . . . . . . . | 15 | 12 | 47.7 |
| ☽ First Quarter, . . . . . . . . . . | 23 | 16 | 26.6 |
| ○ Full Moon, . . . . . . . . . . | 30 | 23 | 4.0 |

| | d | h |
|---|---|---|
| ☾ Perigee, . . . . . . . . . . . . . | 4 | 19.5 |
| ☾ Apogee, . . . . . . . . . . . . . | 20 | 17.7 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | |
| 1 | Fomalhaut | W. | 64 40 27 | 2681 | 66 17 33 | 2660 | 67 55 6 | 2641 | 69 33 5 | 2624 |
| | Saturn | W. | 62 0 55 | 2362 | 63 45 24 | 2351 | 65 30 9 | 2339 | 67 15 11 | 2329 |
| | α Pegasi | W. | 43 24 33 | 2904 | 44 56 47 | 2859 | 46 29 58 | 2819 | 48 4 1 | 2782 |
| | Pollux | E. | 77 59 22 | 2368 | 76 15 2 | 2357 | 74 30 25 | 2345 | 72 45 31 | 2334 |
| 2 | Fomalhaut | W. | 77 48 32 | 2551 | 79 28 35 | 2539 | 81 8 54 | 2528 | 82 49 28 | 2518 |
| | Saturn | W. | 76 4 8 | 2279 | 77 50 38 | 2271 | 79 37 20 | 2263 | 81 24 14 | 2255 |
| | α Pegasi | W. | 56 5 9 | 2638 | 57 43 12 | 2616 | 59 21 45 | 2695 | 61 0 47 | 2576 |
| | Pollux | E. | 63 57 12 | 2285 | 62 10 51 | 2277 | 60 24 17 | 2269 | 58 37 32 | 2261 |
| | Regulus | E. | 100 46 43 | 2282 | 99 0 17 | 2273 | 97 13 38 | 2265 | 95 26 47 | 2257 |
| 3 | Fomalhaut | W. | 91 15 16 | 2484 | 92 56 52 | 2480 | 94 38 34 | 2477 | 96 20 19 | 2475 |
| | Saturn | W. | 90 21 22 | 2224 | 92 9 14 | 2219 | 93 57 13 | 2214 | 95 45 19 | 2211 |
| | α Pegasi | W. | 69 21 48 | 2502 | 71 2 58 | 2492 | 72 44 23 | 2482 | 74 26 2 | 2474 |
| | α Arietis | W. | 25 55 24 | 2353 | 27 40 7 | 2333 | 29 25 18 | 2317 | 31 10 53 | 2302 |
| | Pollux | E. | 49 41 12 | 2231 | 47 53 31 | 2227 | 46 5 43 | 2223 | 44 17 49 | 2219 |
| | Regulus | E. | 86 29 52 | 2225 | 84 42 2 | 2220 | 82 54 5 | 2216 | 81 6 1 | 2212 |
| | Venus | E. | 117 24 37 | 2591 | 115 45 30 | 2587 | 114 6 17 | 2582 | 112 26 57 | 2578 |
| 4 | Saturn | W. | 104 47 0 | 2198 | 106 35 31 | 2197 | 108 24 3 | 2196 | 110 12 36 | 2196 |
| | α Pegasi | W. | 82 56 48 | 2445 | 84 39 19 | 2443 | 86 21 53 | 2441 | 88 4 30 | 2440 |
| | α Arietis | W. | 40 3 4 | 2258 | 41 50 5 | 2252 | 43 37 15 | 2248 | 45 24 31 | 2244 |
| | Pollux | E. | 35 17 18 | 2210 | 33 29 5 | 2210 | 31 40 52 | 2211 | 29 52 41 | 2212 |
| | Regulus | E. | 72 4 29 | 2199 | 70 16 0 | 2198 | 68 27 30 | 2197 | 66 38 58 | 2197 |
| | Venus | E. | 104 9 7 | 2564 | 102 29 23 | 2564 | 100 49 38 | 2563 | 99 9 52 | 2563 |
| | Mars | E. | 117 33 13 | 2403 | 115 49 42 | 2402 | 114 6 10 | 2401 | 112 22 36 | 2400 |
| 5 | α Arietis | W. | 54 21 49 | 2237 | 56 9 21 | 2238 | 57 56 52 | 2239 | 59 44 22 | 2240 |
| | Aldebaran | W. | 24 48 14 | 2623 | 26 26 38 | 2574 | 28 6 8 | 2535 | 29 46 32 | 2504 |
| | Regulus | E. | 57 36 24 | 2202 | 55 47 59 | 2203 | 53 59 36 | 2206 | 52 11 17 | 2208 |
| | Venus | E. | 90 51 10 | 2568 | 89 11 31 | 2571 | 87 31 56 | 2573 | 85 52 24 | 2577 |
| | Mars | E. | 103 44 49 | 2404 | 102 1 20 | 2406 | 100 17 54 | 2408 | 98 34 31 | 2411 |
| | Sun | E. | 132 38 48 | 2533 | 130 58 20 | 2533 | 129 17 53 | 2535 | 127 37 29 | 2537 |
| 6 | α Arietis | W. | 68 41 9 | 2253 | 70 28 18 | 2257 | 72 15 21 | 2261 | 74 2 18 | 2266 |
| | Aldebaran | W. | 38 17 19 | 2413 | 40 0 35 | 2403 | 41 44 5 | 2396 | 43 27 45 | 2391 |
| | Regulus | E. | 43 10 52 | 2227 | 41 23 5 | 2231 | 39 35 24 | 2236 | 37 47 50 | 2241 |
| | Venus | E. | 77 36 0 | 2597 | 75 57 1 | 2603 | 74 18 10 | 2608 | 72 39 26 | 2613 |
| | Mars | E. | 89 58 47 | 2430 | 88 15 55 | 2435 | 86 33 10 | 2440 | 84 50 32 | 2445 |
| | Sun | E. | 119 16 23 | 2554 | 117 36 25 | 2559 | 115 56 33 | 2563 | 114 16 47 | 2568 |
| 7 | Aldebaran | W. | 52 7 24 | 2382 | 53 51 25 | 2383 | 55 35 24 | 2384 | 57 19 21 | 2387 |
| | Regulus | E. | 28 52 4 | 2271 | 27 5 22 | 2278 | 25 18 50 | 2285 | 23 32 28 | 2291 |
| | Venus | E. | 64 27 47 | 2646 | 62 49 54 | 2653 | 61 12 11 | 2660 | 59 34 37 | 2668 |
| | Mars | E. | 76 19 18 | 2475 | 74 37 29 | 2481 | 72 55 49 | 2488 | 71 14 19 | 2494 |
| | Spica | E. | 82 51 20 | 2266 | 81 4 31 | 2272 | 79 17 51 | 2279 | 77 31 20 | 2285 |
| | Sun | E. | 105 59 49 | 2597 | 104 20 50 | 2604 | 102 42 0 | 2610 | 101 3 18 | 2617 |
| 8 | Aldebaran | W. | 65 58 5 | 2405 | 67 41 33 | 2410 | 69 24 54 | 2415 | 71 8 8 | 2420 |
| | Pollux | W. | 22 18 30 | 2342 | 24 3 28 | 2346 | 25 48 20 | 2351 | 27 33 5 | 2356 |
| | Venus | E. | 51 29 26 | 2707 | 49 52 56 | 2716 | 48 16 38 | 2725 | 46 40 31 | 2733 |
| | Mars | E. | 62 49 15 | 2531 | 61 8 45 | 2538 | 59 28 25 | 2546 | 57 48 16 | 2554 |
| | Spica | E. | 68 41 7 | 2318 | 66 55 34 | 2325 | 65 10 11 | 2333 | 63 24 59 | 2339 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Fomalhaut | W. | 71° 11′ 27″ | 2607 | 72° 50′ 12″ | 2591 | 74° 29′ 19″ | 2577 | 76° 8′ 46″ | 2563 |
| | Saturn | W. | 69 0 28 | 2318 | 70 46 1 | 2308 | 72 31 49 | 2298 | 74 17 52 | 2289 |
| | α Pegasi | W. | 49 38 52 | 2749 | 51 14 27 | 2717 | 52 50 44 | 2689 | 54 27 39 | 2663 |
| | Pollux | E. | 71 0 21 | 2324 | 69 14 56 | 2313 | 67 29 15 | 2303 | 65 43 20 | 2294 |
| 2 | Fomalhaut | W. | 84 30 16 | 2510 | 86 11 16 | 2502 | 87 52 27 | 2495 | 89 33 47 | 2489 |
| | Saturn | W. | 83 11 20 | 2248 | 84 58 36 | 2241 | 86 46 2 | 2235 | 88 33 38 | 2229 |
| | α Pegasi | W. | 62 40 15 | 2559 | 64 20 7 | 2543 | 66 0 21 | 2528 | 67 40 55 | 2515 |
| | Pollux | E. | 56 50 35 | 2254 | 55 3 28 | 2247 | 53 16 11 | 2242 | 51 28 46 | 2236 |
| | Regulus | E. | 93 29 44 | 2250 | 91 52 31 | 2243 | 90 5 7 | 2237 | 88 17 34 | 2231 |
| 3 | Fomalhaut | W. | 98 2 7 | 2474 | 99 43 57 | 2474 | 101 25 47 | 2475 | 103 7 36 | 2477 |
| | Saturn | W. | 97 33 30 | 2208 | 99 21 46 | 2204 | 101 10 7 | 2202 | 102 58 32 | 2200 |
| | α Pegasi | W. | 76 7 52 | 2466 | 77 49 53 | 2459 | 79 32 4 | 2453 | 81 14 23 | 2449 |
| | α Arietis | W. | 32 56 49 | 2290 | 34 43 3 | 2281 | 36 29 31 | 2272 | 38 16 12 | 2264 |
| | Pollux | E. | 42 29 50 | 2216 | 40 41 47 | 2214 | 38 53 40 | 2212 | 37 5 30 | 2210 |
| | Regulus | E. | 79 17 52 | 2208 | 77 29 37 | 2206 | 75 41 18 | 2203 | 73 52 55 | 2201 |
| | Venus | E. | 110 47 32 | 2574 | 109 8 2 | 2571 | 107 28 27 | 2569 | 105 48 49 | 2566 |
| 4 | Saturn | W. | 112 1 10 | 2196 | 113 49 44 | 2196 | 115 38 17 | 2197 | 117 26 49 | 2199 |
| | α Pegasi | W. | 89 47 8 | 2439 | 91 29 47 | 2441 | 93 12 24 | 2442 | 94 54 59 | 2445 |
| | α Arietis | W. | 47 11 53 | 2241 | 48 59 19 | 2240 | 50 46 47 | 2239 | 52 34 17 | 2237 |
| | Pollux | E. | 28 4 32 | 2214 | 26 16 26 | 2217 | 24 28 24 | 2221 | 22 40 28 | 2226 |
| | Regulus | E. | 64 50 26 | 2197 | 63 1 54 | 2197 | 61 13 22 | 2198 | 59 24 52 | 2200 |
| | Venus | E. | 97 30 6 | 2563 | 95 50 20 | 2564 | 94 10 35 | 2564 | 92 30 51 | 2566 |
| | Mars | E. | 110 39 2 | 2400 | 108 55 27 | 2401 | 107 11 53 | 2401 | 105 28 20 | 2403 |
| 5 | α Arietis | W. | 61 31 50 | 2242 | 63 19 15 | 2244 | 65 6 37 | 2247 | 66 53 55 | 2249 |
| | Aldebaran | W. | 31 27 40 | 2477 | 33 9 25 | 2456 | 34 51 40 | 2439 | 36 34 19 | 2424 |
| | Regulus | E. | 50 23 2 | 2212 | 48 34 52 | 2214 | 46 46 46 | 2218 | 44 58 46 | 2223 |
| | Venus | E. | 84 12 57 | 2580 | 82 33 34 | 2584 | 80 54 17 | 2588 | 79 15 5 | 2593 |
| | Mars | E. | 96 51 12 | 2415 | 95 7 58 | 2418 | 93 24 49 | 2422 | 91 41 45 | 2426 |
| | Sun | E. | 125 57 7 | 2540 | 124 16 49 | 2543 | 122 36 36 | 2546 | 120 56 27 | 2550 |
| 6 | α Arietis | W. | 75 49 8 | 2270 | 77 35 51 | 2275 | 79 22 27 | 2281 | 81 8 55 | 2285 |
| | Aldebaran | W. | 45 11 32 | 2387 | 46 55 25 | 2384 | 48 39 23 | 2382 | 50 23 23 | 2382 |
| | Regulus | E. | 36 0 24 | 2247 | 34 13 6 | 2252 | 32 25 56 | 2258 | 30 38 55 | 2265 |
| | Venus | E. | 71 0 49 | 2620 | 69 22 21 | 2626 | 67 44 1 | 2632 | 66 5 49 | 2639 |
| | Mars | E. | 83 8 1 | 2450 | 81 25 38 | 2456 | 79 43 23 | 2462 | 78 1 16 | 2468 |
| | Sun | E. | 112 37 8 | 2574 | 110 57 37 | 2579 | 109 18 13 | 2585 | 107 38 57 | 2591 |
| 7 | Aldebaran | W. | 59 3 15 | 2389 | 60 47 5 | 2392 | 62 30 51 | 2396 | 64 14 31 | 2401 |
| | Regulus | E. | 21 46 16 | 2299 | 20 0 15 | 2308 | 18 14 27 | 2317 | 16 28 52 | 2326 |
| | Venus | E. | 57 57 14 | 2675 | 56 20 1 | 2684 | 54 42 59 | 2691 | 53 6 7 | 2699 |
| | Mars | E. | 69 32 58 | 2502 | 67 51 47 | 2509 | 66 10 46 | 2516 | 64 29 55 | 2524 |
| | Spica | E. | 75 44 58 | 2291 | 73 58 46 | 2298 | 72 12 43 | 2304 | 70 26 50 | 2311 |
| | Sun | E. | 99 24 46 | 2624 | 97 46 23 | 2631 | 96 8 10 | 2638 | 94 30 7 | 2645 |
| 8 | Aldebaran | W. | 72 51 14 | 2426 | 74 34 12 | 2431 | 76 17 2 | 2438 | 77 59 43 | 2444 |
| | Pollux | W. | 29 17 43 | 2362 | 31 2 13 | 2367 | 32 46 35 | 2373 | 34 30 48 | 2380 |
| | Venus | E. | 45 4 35 | 2742 | 43 28 51 | 2752 | 41 53 20 | 2761 | 40 18 1 | 2770 |
| | Mars | E. | 56 8 18 | 2563 | 54 28 32 | 2571 | 52 48 57 | 2579 | 51 9 33 | 2588 |
| | Spica | E. | 61 39 57 | 2346 | 59 55 5 | 2354 | 58 10 24 | 2362 | 56 25 54 | 2368 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Sun | E. | 92° 52′ 13″ | 2653 | 91° 14′ 29″ | 2660 | 89° 36′ 56″ | 2668 | 87° 59′ 33″ | 2676 |
| 9 | Aldebaran | W. | 79 42 15 | 2450 | 81 24 38 | 2458 | 83 6 51 | 2464 | 84 48 55 | 2471 |
| | Pollux | W. | 36 14 52 | 2386 | 37 58 47 | 2392 | 39 42 33 | 2399 | 41 26 9 | 2406 |
| | Venus | E. | 38 42 54 | 2780 | 37 8 0 | 2790 | 35 33 19 | 2801 | 33 58 52 | 2811 |
| | Mars | E. | 49 30 21 | 2596 | 47 51 20 | 2604 | 46 12 31 | 2613 | 44 33 54 | 2622 |
| | Spica | E. | 54 41 34 | 2376 | 52 57 25 | 2383 | 51 13 26 | 2391 | 49 29 38 | 2398 |
| | Sun | E. | 79 55 18 | 2716 | 78 18 59 | 2724 | 76 42 51 | 2732 | 75 6 54 | 2741 |
| 10 | Aldebaran | W. | 93 16 41 | 2508 | 94 57 43 | 2517 | 96 38 33 | 2525 | 98 19 12 | 2533 |
| | Pollux | W. | 50 1 40 | 2441 | 51 44 16 | 2449 | 53 26 41 | 2456 | 55 8 56 | 2464 |
| | Regulus | W. | 13 11 31 | 2454 | 14 53 49 | 2458 | 16 36 2 | 2462 | 18 18 8 | 2467 |
| | Venus | E. | 26 10 15 | 2872 | 24 37 20 | 2887 | 23 4 44 | 2902 | 21 32 28 | 2920 |
| | Mars | E. | 36 23 52 | 2669 | 34 46 30 | 2679 | 33 9 22 | 2689 | 31 32 28 | 2700 |
| | Spica | E. | 40 53 19 | 2436 | 39 10 36 | 2443 | 37 28 3 | 2452 | 35 45 42 | 2459 |
| | Sun | E. | 67 9 56 | 2783 | 65 35 6 | 2792 | 64 0 27 | 2801 | 62 26 0 | 2809 |
| 11 | Pollux | W. | 63 37 34 | 2501 | 65 18 46 | 2509 | 66 59 47 | 2516 | 68 40 38 | 2524 |
| | Regulus | W. | 26 46 30 | 2501 | 28 27 42 | 2509 | 30 8 43 | 2516 | 31 49 34 | 2523 |
| | Spica | E. | 27 16 38 | 2498 | 25 35 22 | 2507 | 23 54 18 | 2515 | 22 13 25 | 2522 |
| | Sun | E. | 54 36 37 | 2855 | 53 3 20 | 2864 | 51 30 15 | 2873 | 49 57 22 | 2883 |
| 12 | Pollux | W. | 77 2 9 | 2563 | 78 41 55 | 2572 | 80 21 29 | 2579 | 82 0 53 | 2588 |
| | Regulus | W. | 40 11 13 | 2561 | 41 51 1 | 2569 | 43 30 38 | 2577 | 45 10 4 | 2585 |
| | Sun | E. | 42 16 5 | 2934 | 40 44 29 | 2944 | 39 13 6 | 2955 | 37 41 57 | 2967 |
| 13 | Pollux | W. | 90 15 3 | 2629 | 91 53 19 | 2637 | 93 31 24 | 2646 | 95 9 17 | 2654 |
| | Regulus | W. | 53 24 29 | 2626 | 55 2 48 | 2635 | 56 40 56 | 2643 | 58 18 53 | 2652 |
| 17 | Fomalhaut | E. | 78 40 10 | 3188 | 77 13 47 | 3199 | 75 47 37 | 3212 | 74 21 42 | 3225 |
| | Saturn | E. | 79 3 59 | 2920 | 77 32 6 | 2929 | 76 0 24 | 2938 | 74 28 53 | 2946 |
| 18 | Sun | W. | 28 27 27 | 3419 | 29 49 22 | 3422 | 31 11 14 | 3426 | 32 33 1 | 3430 |
| | Saturn | E. | 66 53 56 | 2987 | 65 23 27 | 2994 | 63 53 7 | 3001 | 62 22 56 | 3009 |
| | Fomalhaut | E. | 67 16 1 | 3294 | 65 51 43 | 3309 | 64 27 42 | 3325 | 63 4 0 | 3341 |
| | α Pegasi | E. | 89 0 13 | 3220 | 87 34 27 | 3227 | 86 8 50 | 3236 | 84 43 23 | 3244 |
| 19 | Sun | W. | 39 20 44 | 3453 | 40 42 1 | 3456 | 42 3 14 | 3461 | 43 24 22 | 3464 |
| | Saturn | E. | 54 54 11 | 3042 | 53 24 50 | 3047 | 51 55 36 | 3052 | 50 26 28 | 3058 |
| | Fomalhaut | E. | 56 10 20 | 3432 | 54 48 40 | 3453 | 53 27 23 | 3474 | 52 6 30 | 3497 |
| | α Pegasi | E. | 77 38 36 | 3287 | 76 14 9 | 3295 | 74 49 52 | 3304 | 73 25 45 | 3313 |
| 20 | Sun | W. | 50 9 1 | 3481 | 51 29 46 | 3484 | 52 50 28 | 3486 | 54 11 8 | 3488 |
| | Saturn | E. | 43 2 17 | 3078 | 41 33 41 | 3082 | 40 5 9 | 3085 | 38 36 41 | 3087 |
| | Fomalhaut | E. | 45 28 59 | 3636 | 44 11 4 | 3670 | 42 53 45 | 3708 | 41 37 6 | 3747 |
| | α Pegasi | E. | 66 27 52 | 3360 | 65 4 50 | 3371 | 63 42 0 | 3381 | 62 19 22 | 3392 |
| | α Arietis | E. | 107 49 29 | 3095 | 106 21 13 | 3098 | 104 53 1 | 3101 | 103 24 52 | 3102 |
| 21 | Sun | W. | 60 54 5 | 3491 | 62 14 39 | 3490 | 63 35 14 | 3489 | 64 55 50 | 3488 |
| | Saturn | E. | 31 14 51 | 3093 | 29 46 33 | 3092 | 28 18 14 | 3092 | 26 49 55 | 3091 |
| | Fomalhaut | E. | 35 25 48 | 4020 | 34 14 28 | 4095 | 33 4 21 | 4178 | 31 55 34 | 4273 |
| | α Pegasi | E. | 55 29 22 | 3452 | 54 8 4 | 3466 | 52 47 2 | 3480 | 51 26 16 | 3496 |
| | α Arietis | E. | 96 4 32 | 3106 | 94 36 30 | 3106 | 93 8 28 | 3105 | 91 40 25 | 3104 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Sun | E. | 86° 22′ 21″ | 2684 | 84° 45′ 19″ | 2692 | 83° 8′ 28″ | 2700 | 81° 31′ 48″ | 2707 |
| 9 | Aldebaran | W. | 86 30 49 | 2478 | 88 12 33 | 2486 | 89 54 6 | 2493 | 91 35 29 | 2501 |
| | Pollux | W. | 43 9 35 | 2412 | 44 52 52 | 2420 | 46 35 58 | 2427 | 48 18 54 | 2434 |
| | Venus | E. | 32 24 39 | 2822 | 30 50 40 | 2834 | 29 16 56 | 2845 | 27 43 27 | 2859 |
| | Mars | E. | 42 55 29 | 2631 | 41 17 16 | 2640 | 39 39 15 | 2649 | 38 1 27 | 2659 |
| | Spica | E. | 47 46 1 | 2405 | 46 2 34 | 2413 | 44 19 18 | 2421 | 42 36 13 | 2429 |
| | Sun | E. | 73 31 8 | 2749 | 71 55 33 | 2757 | 70 20 9 | 2766 | 68 44 57 | 2775 |
| 10 | Aldebaran | W. | 99 59 39 | 2541 | 101 39 55 | 2550 | 103 19 59 | 2559 | 104 59 51 | 2568 |
| | Pollux | W. | 56 51 0 | 2471 | 58 32 54 | 2478 | 60 14 38 | 2486 | 61 56 11 | 2493 |
| | Regulus | W. | 20 0 7 | 2474 | 21 41 57 | 2480 | 23 23 38 | 2487 | 25 5 9 | 2494 |
| | Venus | E. | 20 0 34 | 2939 | 18 29 5 | 2962 | 16 58 5 | 2991 | 15 27 41 | 3025 |
| | Mars | E. | 29 55 48 | 2712 | 28 19 24 | 2724 | 26 43 16 | 2737 | 25 7 25 | 2750 |
| | Spica | E. | 34 3 31 | 2467 | 32 21 32 | 2475 | 30 39 43 | 2482 | 28 58 5 | 2490 |
| | Sun | E. | 60 51 44 | 2818 | 59 17 40 | 2827 | 57 43 47 | 2836 | 56 10 6 | 2845 |
| 11 | Pollux | W. | 70 21 18 | 2532 | 72 1 47 | 2540 | 73 42 5 | 2548 | 75 22 12 | 2555 |
| | Regulus | W. | 33 30 15 | 2531 | 35 10 45 | 2538 | 36 51 5 | 2546 | 38 31 14 | 2553 |
| | Spica | E. | 20 32 43 | 2531 | 18 52 13 | 2540 | 17 11 55 | 2548 | 15 31 49 | 2558 |
| | Sun | E. | 48 24 41 | 2893 | 46 52 13 | 2902 | 45 19 57 | 2912 | 43 47 54 | 2924 |
| 12 | Pollux | W. | 83 40 5 | 2596 | 85 19 6 | 2604 | 86 57 56 | 2612 | 88 36 35 | 2620 |
| | Regulus | W. | 46 49 19 | 2593 | 48 28 23 | 2601 | 50 7 16 | 2610 | 51 45 58 | 2618 |
| | Sun | E. | 36 11 3 | 2978 | 34 40 23 | 2991 | 33 9 59 | 3004 | 31 39 51 | 3018 |
| 13 | Pollux | W. | 96 46 59 | 2663 | 98 24 29 | 2672 | 100 1 47 | 2681 | 101 38 53 | 2689 |
| | Regulus | W. | 59 56 38 | 2660 | 61 34 12 | 2669 | 63 11 34 | 2678 | 64 48 44 | 2686 |
| 17 | Fomalhaut | E. | 72 56 2 | 3238 | 71 30 38 | 3251 | 70 5 29 | 3265 | 68 40 37 | 3279 |
| | Saturn | E. | 72 57 33 | 2954 | 71 26 23 | 2963 | 69 55 24 | 2971 | 68 24 35 | 2979 |
| 18 | Sun | W. | 33 54 44 | 3435 | 35 16 21 | 3438 | 36 37 54 | 3443 | 37 59 22 | 3448 |
| | Saturn | E. | 60 52 54 | 3016 | 59 23 1 | 3022 | 57 53 16 | 3030 | 56 23 40 | 3035 |
| | Fomalhaut | E. | 61 40 36 | 3358 | 60 17 31 | 3376 | 58 54 47 | 3393 | 57 32 23 | 3412 |
| | α Pegasi | E. | 83 18 6 | 3253 | 81 52 59 | 3260 | 80 28 1 | 3269 | 79 3 13 | 3278 |
| 19 | Sun | W. | 44 45 26 | 3468 | 46 6 26 | 3472 | 47 27 21 | 3475 | 48 48 13 | 3479 |
| | Saturn | E. | 48 57 27 | 3063 | 47 28 32 | 3067 | 45 59 42 | 3071 | 44 30 57 | 3075 |
| | Fomalhaut | E. | 50 46 3 | 3522 | 49 26 3 | 3547 | 48 6 31 | 3575 | 46 47 29 | 3604 |
| | α Pegasi | E. | 72 1 49 | 3323 | 70 38 4 | 3332 | 69 14 29 | 3341 | 67 51 5 | 3351 |
| 20 | Sun | W. | 55 31 46 | 3489 | 56 52 22 | 3490 | 58 12 57 | 3491 | 59 33 31 | 3491 |
| | Saturn | E. | 37 8 15 | 3089 | 35 39 52 | 3090 | 34 11 30 | 3091 | 32 43 10 | 3092 |
| | Fomalhaut | E. | 40 21 9 | 3792 | 39 5 59 | 3841 | 37 51 39 | 3895 | 36 38 14 | 3953 |
| | α Pegasi | E. | 60 56 56 | 3403 | 59 34 43 | 3414 | 58 12 42 | 3426 | 56 50 55 | 3438 |
| | α Arietis | E. | 101 56 45 | 3104 | 100 28 40 | 3105 | 99 0 36 | 3106 | 97 32 34 | 3106 |
| 21 | Sun | W. | 66 16 28 | 3486 | 67 37 8 | 3484 | 68 57 50 | 3480 | 70 18 36 | 3477 |
| | Saturn | E. | 25 21 34 | 3090 | 23 53 12 | 3088 | 22 24 48 | 3086 | 20 56 21 | 3083 |
| | Fomalhaut | E. | 30 48 16 | 4381 | 29 42 38 | 4505 | 28 38 50 | 4646 | 27 37 5 | 4811 |
| | α Pegasi | E. | 50 5 47 | 3513 | 48 45 37 | 3531 | 47 25 47 | 3551 | 46 6 19 | 3572 |
| | α Arietis | E. | 90 12 20 | 3103 | 88 44 14 | 3101 | 87 16 5 | 3098 | 85 47 53 | 3096 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | Sun | W. | 71° 39′ 26″ | 3473 | 73° 0′ 20″ | 3469 | 74° 21′ 19″ | 3463 | 75° 42′ 24″ | 3459 |
| | α Pegasi | E. | 44 47 14 | 3596 | 43 28 35 | 3622 | 42 10 24 | 3650 | 40 52 44 | 3681 |
| | α Arietis | E. | 84 19 38 | 3092 | 82 51 19 | 3089 | 81 22 56 | 3084 | 79 54 27 | 3080 |
| 23 | Sun | W. | 82 29 27 | 3424 | 83 51 16 | 3415 | 85 13 15 | 3407 | 86 35 24 | 3398 |
| | α Aquilæ | W. | 38 48 14 | 5947 | 39 34 0 | 5748 | 40 21 55 | 5566 | 41 11 53 | 5401 |
| | α Arietis | E. | 72 30 30 | 3051 | 71 1 20 | 3043 | 69 32 1 | 3035 | 68 2 32 | 3028 |
| | Aldebaran | E. | 103 43 39 | 3101 | 102 15 30 | 3091 | 100 47 10 | 3082 | 99 18 39 | 3073 |
| 24 | Sun | W. | 93 28 59 | 3344 | 94 52 20 | 3331 | 96 15 56 | 3318 | 97 39 47 | 3306 |
| | α Aquilæ | W. | 45 48 54 | 4754 | 46 49 8 | 4653 | 47 50 47 | 4558 | 48 53 48 | 4471 |
| | α Arietis | E. | 60 32 32 | 2981 | 59 1 56 | 2972 | 57 31 8 | 2961 | 56 0 6 | 2950 |
| | Aldebaran | E. | 91 53 6 | 3022 | 90 23 20 | 3010 | 88 53 20 | 2999 | 87 23 6 | 2986 |
| 25 | Sun | W. | 104 42 58 | 3233 | 106 8 28 | 3217 | 107 34 17 | 3201 | 109 0 25 | 3185 |
| | α Aquilæ | W. | 54 27 9 | 4104 | 55 37 7 | 4042 | 56 48 5 | 3984 | 58 0 0 | 3929 |
| | Saturn | W. | 16 40 34 | 2861 | 18 13 43 | 2845 | 19 47 12 | 2831 | 21 21 0 | 2815 |
| | α Arietis | E. | 48 21 24 | 2891 | 46 48 54 | 2880 | 45 16 9 | 2867 | 43 43 8 | 2855 |
| | Aldebaran | E. | 79 47 58 | 2922 | 78 16 7 | 2908 | 76 43 58 | 2894 | 75 11 32 | 2880 |
| 26 | Sun | W. | 116 16 3 | 3100 | 117 44 13 | 3082 | 119 12 45 | 3064 | 120 41 39 | 3046 |
| | α Aquilæ | W. | 64 12 43 | 3690 | 65 29 41 | 3649 | 66 47 23 | 3609 | 68 5 48 | 3570 |
| | Fomalhaut | W. | 35 57 11 | 3565 | 37 16 23 | 3488 | 38 37 1 | 3417 | 39 58 58 | 3351 |
| | Saturn | W. | 29 15 11 | 2734 | 30 51 6 | 2716 | 32 27 24 | 2700 | 34 4 4 | 2682 |
| | α Arietis | E. | 35 54 9 | 2796 | 34 19 36 | 2786 | 32 44 50 | 2776 | 31 9 51 | 2768 |
| | Aldebaran | E. | 67 24 43 | 2807 | 65 50 24 | 2792 | 64 15 46 | 2778 | 62 40 49 | 2763 |
| 27 | Sun | W. | 128 11 48 | 2954 | 129 42 59 | 2935 | 131 14 33 | 2917 | 132 46 30 | 2899 |
| | α Aquilæ | W. | 74 47 53 | 3400 | 76 10 9 | 3371 | 77 32 59 | 3342 | 78 56 22 | 3315 |
| | Fomalhaut | W. | 47 5 55 | 3088 | 48 34 19 | 3045 | 50 3 36 | 3003 | 51 33 45 | 2965 |
| | Saturn | W. | 42 13 22 | 2593 | 43 52 27 | 2575 | 45 31 56 | 2557 | 47 11 50 | 2538 |
| | α Pegasi | W. | 27 33 26 | 3959 | 28 45 46 | 3800 | 30 0 48 | 3662 | 31 18 16 | 3541 |
| | Aldebaran | E. | 54 41 15 | 2692 | 53 4 25 | 2679 | 51 27 17 | 2666 | 49 49 52 | 2655 |
| | Pollux | E. | 97 18 37 | 2585 | 95 39 21 | 2566 | 93 59 39 | 2548 | 92 19 32 | 2530 |
| 28 | α Aquilæ | W. | 86 0 45 | 3196 | 87 26 59 | 3176 | 88 53 37 | 3158 | 90 20 36 | 3141 |
| | Fomalhaut | W. | 59 16 0 | 2795 | 60 50 34 | 2766 | 62 25 47 | 2738 | 64 1 37 | 2710 |
| | Saturn | W. | 55 37 40 | 2448 | 57 20 6 | 2431 | 59 2 57 | 2413 | 60 46 13 | 2396 |
| | α Pegasi | W. | 38 14 57 | 3101 | 39 43 5 | 3037 | 41 12 32 | 2978 | 42 43 12 | 2924 |
| | Aldebaran | E. | 41 39 8 | 2609 | 40 0 25 | 2604 | 38 21 35 | 2601 | 36 42 41 | 2601 |
| | Pollux | E. | 83 52 39 | 2440 | 82 10 1 | 2422 | 80 26 57 | 2404 | 78 43 28 | 2387 |
| 29 | Fomalhaut | W. | 72 9 23 | 2591 | 73 48 31 | 2570 | 75 28 7 | 2550 | 77 8 11 | 2531 |
| | Saturn | W. | 69 28 42 | 2313 | 71 14 23 | 2296 | 73 0 28 | 2281 | 74 46 56 | 2266 |
| | α Pegasi | W. | 50 32 14 | 2707 | 52 8 45 | 2672 | 53 46 2 | 2640 | 55 24 3 | 2608 |
| | Pollux | E. | 69 59 57 | 2304 | 68 14 3 | 2289 | 66 27 47 | 2273 | 64 41 8 | 2258 |
| | Regulus | E. | 106 49 59 | 2300 | 105 3 59 | 2284 | 103 17 36 | 2269 | 101 30 51 | 2253 |
| 30 | Fomalhaut | W. | 85 34 38 | 2451 | 87 17 0 | 2438 | 88 59 40 | 2426 | 90 42 37 | 2415 |
| | Saturn | W. | 83 44 31 | 2198 | 85 33 1 | 2186 | 87 21 50 | 2174 | 89 10 57 | 2163 |
| | α Pegasi | W. | 63 43 53 | 2482 | 65 25 32 | 2460 | 67 7 41 | 2441 | 68 50 17 | 2424 |
| | Pollux | E. | 55 42 37 | 2191 | 53 53 56 | 2179 | 52 4 57 | 2168 | 50 15 41 | 2157 |
| | Regulus | E. | 92 31 41 | 2185 | 90 42 51 | 2173 | 88 53 43 | 2161 | 87 4 17 | 2151 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 22 | Sun | W. | 77° 3′ 34″ | 3453 | 78° 24′ 51″ | 3446 | 79° 46′ 15″ | 3439 | 81° 7′ 47″ | 3432 |
| | α Pegasi | E. | 39 35 37 | 3717 | 38 19 8 | 3757 | 37 3 21 | 3802 | 35 48 21 | 3853 |
| | α Arietis | E. | 78 25 53 | 3075 | 76 57 13 | 3069 | 75 28 26 | 3064 | 73 59 32 | 3057 |
| 23 | Sun | W. | 87 57 43 | 3388 | 89 20 13 | 3377 | 90 42 56 | 3366 | 92 5 51 | 3355 |
| | α Aquilæ | W. | 42 3 47 | 5249 | 42 57 32 | 5111 | 43 53 1 | 4983 | 44 50 10 | 4864 |
| | α Arietis | E. | 66 32 54 | 3019 | 65 3 5 | 3011 | 63 33 6 | 3001 | 62 2 55 | 2992 |
| | Aldebaran | E. | 97 49 57 | 3064 | 96 21 3 | 3054 | 94 51 57 | 3043 | 93 22 38 | 3033 |
| 24 | Sun | W. | 99 3 52 | 3292 | 100 28 13 | 3277 | 101 52 51 | 3263 | 103 17 46 | 3248 |
| | α Aquilæ | W. | 49 58 6 | 4387 | 51 3 39 | 4310 | 52 10 22 | 4237 | 53 18 13 | 4168 |
| | α Arietis | E. | 54 28 51 | 2939 | 52 57 21 | 2927 | 51 25 37 | 2916 | 49 53 38 | 2904 |
| | Aldebaran | E. | 85 52 36 | 2974 | 84 21 51 | 2962 | 82 50 50 | 2948 | 81 19 32 | 2935 |
| 25 | Sun | W. | 110 26 52 | 3168 | 111 53 39 | 3152 | 113 20 46 | 3134 | 114 48 14 | 3117 |
| | α Aquilæ | W. | 59 12 50 | 3877 | 60 26 33 | 3826 | 61 41 8 | 3779 | 62 56 32 | 3734 |
| | Saturn | W. | 22 55 9 | 2799 | 24 29 38 | 2784 | 26 4 27 | 2767 | 27 39 38 | 2750 |
| | α Arietis | E. | 42 9 51 | 2843 | 40 36 19 | 2831 | 39 2 31 | 2818 | 37 28 27 | 2808 |
| | Aldebaran | E. | 73 38 47 | 2866 | 72 5 44 | 2852 | 70 32 23 | 2837 | 68 58 43 | 2821 |
| 26 | Sun | W. | 122 10 55 | 3027 | 123 40 34 | 3009 | 125 10 36 | 2991 | 126 41 0 | 2972 |
| | α Aquilæ | W. | 69 24 55 | 3534 | 70 44 42 | 3498 | 72 5 8 | 3464 | 73 26 12 | 3431 |
| | Fomalhaut | W. | 41 22 10 | 3292 | 42 46 31 | 3236 | 44 11 58 | 3183 | 45 38 27 | 3134 |
| | Saturn | W. | 35 41 8 | 2664 | 37 18 36 | 2647 | 38 56 27 | 2629 | 40 34 42 | 2611 |
| | α Arietis | E. | 29 34 41 | 2760 | 27 59 21 | 2755 | 26 23 54 | 2752 | 24 48 23 | 2753 |
| | Aldebaran | E. | 61 5 32 | 2748 | 59 29 56 | 2734 | 57 54 1 | 2719 | 56 17 47 | 2706 |
| 27 | Sun | W. | 134 18 50 | 2881 | 135 51 33 | 2863 | 137 24 39 | 2846 | 138 58 7 | 2829 |
| | α Aquilæ | W. | 80 20 16 | 3288 | 81 44 41 | 3264 | 83 9 35 | 3240 | 84 34 57 | 3218 |
| | Fomalhaut | W. | 53 4 42 | 2927 | 54 36 26 | 2893 | 56 8 54 | 2859 | 57 42 6 | 2826 |
| | Saturn | W. | 48 52 10 | 2521 | 50 32 54 | 2502 | 52 14 4 | 2485 | 53 55 39 | 2466 |
| | α Pegasi | W. | 32 37 55 | 3432 | 33 59 35 | 3337 | 35 23 4 | 3250 | 36 48 14 | 3172 |
| | Aldebaran | E. | 48 12 11 | 2643 | 46 34 15 | 2633 | 44 56 5 | 2624 | 43 17 42 | 2615 |
| | Pollux | E. | 90 39 0 | 2512 | 88 58 3 | 2493 | 87 16 40 | 2475 | 85 34 52 | 2458 |
| 28 | α Aquilæ | W. | 91 47 56 | 3124 | 93 15 36 | 3110 | 94 43 33 | 3097 | 96 11 46 | 3087 |
| | Fomalhaut | W. | 65 38 3 | 2684 | 67 15 4 | 2660 | 68 52 38 | 2635 | 70 30 45 | 2612 |
| | Saturn | W. | 62 29 54 | 2378 | 64 14 0 | 2362 | 65 58 30 | 2345 | 67 43 24 | 2328 |
| | α Pegasi | W. | 44 15 0 | 2873 | 45 47 53 | 2828 | 47 21 45 | 2785 | 48 56 33 | 2744 |
| | Aldebaran | E. | 35 3 47 | 2603 | 33 24 56 | 2609 | 31 46 13 | 2619 | 30 7 44 | 2635 |
| | Pollux | E. | 76 59 35 | 2370 | 75 15 17 | 2353 | 73 30 34 | 2336 | 71 45 27 | 2320 |
| 29 | Fomalhaut | W. | 78 48 41 | 2513 | 80 29 36 | 2496 | 82 10 55 | 2480 | 83 52 36 | 2465 |
| | Saturn | W. | 76 33 45 | 2251 | 78 20 56 | 2238 | 80 8 27 | 2224 | 81 56 19 | 2210 |
| | α Pegasi | W. | 57 2 47 | 2580 | 58 42 10 | 2553 | 60 22 10 | 2527 | 62 2 45 | 2504 |
| | Pollux | E. | 62 54 7 | 2244 | 61 6 45 | 2230 | 59 19 2 | 2216 | 57 30 59 | 2204 |
| | Regulus | E. | 99 43 43 | 2239 | 97 56 14 | 2225 | 96 8 23 | 2211 | 94 20 12 | 2198 |
| 30 | Fomalhaut | W. | 92 25 50 | 2405 | 94 9 17 | 2397 | 95 52 56 | 2390 | 97 36 45 | 2383 |
| | Saturn | W. | 91 0 20 | 2153 | 92 49 59 | 2143 | 94 39 53 | 2134 | 96 30 1 | 2124 |
| | α Pegasi | W. | 70 33 18 | 2407 | 72 16 43 | 2391 | 74 0 31 | 2377 | 75 44 39 | 2364 |
| | Pollux | E. | 48 26 9 | 2147 | 46 36 22 | 2137 | 44 46 20 | 2129 | 42 56 5 | 2121 |
| | Regulus | E. | 85 14 35 | 2140 | 83 24 37 | 2130 | 81 34 23 | 2120 | 79 43 55 | 2112 |

## AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S Apparent Right Ascension. | THE SUN'S Diff. for 1 hour. | THE SUN'S Apparent Declination. | THE SUN'S Diff. for 1 hour. | THE SUN'S Semi-diameter. | Sidereal Time of the Semi-diameter passing the Meridian. | Equation of Time, *to be subtracted from* / *added to* *Apparent Time.* | Diff. for 1 hour. |
|---|---|---|---|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ | ′ ″ | s | m s | s |
| Frid. | 1 | 16 32 8.05 | 10.813 | S. 21 55 16.4 | −22.65 | 16 16.15 | 70.36 | 10 34.54 | 0.955 |
| Sat. | 2 | 16 36 27.91 | 10.840 | 22 4 7.5 | 21.59 | 16 16.30 | 70.44 | 10 11.31 | 0.981 |
| *Sun.* | 3 | 16 40 48.37 | 10.865 | 22 12 33.1 | 20.52 | 16 16.44 | 70.52 | 9 47.47 | 1.006 |
| Mon. | 4 | 16 45 9.43 | 10.890 | 22 20 33.0 | 19.45 | 16 16.57 | 70.60 | 9 23.04 | 1.030 |
| Tues. | 5 | 16 49 31.07 | 10.913 | 22 28 6.8 | 18.36 | 16 16.70 | 70.68 | 8 58.03 | 1.053 |
| Wed. | 6 | 16 53 53.26 | 10.935 | 22 35 14.5 | 17.27 | 16 16.82 | 70.75 | 8 32.47 | 1.076 |
| Thur. | 7 | 16 58 15.97 | 10.956 | 22 41 55.7 | 16.16 | 16 16.94 | 70.82 | 8 6.39 | 1.097 |
| Frid. | 8 | 17 2 39.19 | 10.976 | 22 48 10.0 | 15.04 | 16 17.05 | 70.88 | 7 39.79 | 1.117 |
| Sat. | 9 | 17 7 2.87 | 10.995 | 22 53 57.5 | 13.91 | 16 17.16 | 70.94 | 7 12.73 | 1.136 |
| *Sun.* | 10 | 17 11 26.99 | 11.013 | 22 59 17.8 | 12.78 | 16 17.26 | 70.99 | 6 45.25 | 1.154 |
| Mon. | 11 | 17 15 51.53 | 11.030 | 23 4 10.7 | 11.64 | 16 17.36 | 71.04 | 6 17.35 | 1.170 |
| Tues. | 12 | 17 20 16.47 | 11.046 | 23 8 36.3 | 10.49 | 16 17.45 | 71.08 | 5 49.05 | 1.186 |
| Wed. | 13 | 17 24 41.74 | 11.059 | 23 12 34.1 | 9.33 | 16 17.54 | 71.13 | 5 20.42 | 1.199 |
| Thur. | 14 | 17 29 7.32 | 11.072 | 23 16 4.1 | 8.17 | 16 17.63 | 71.17 | 4 51.46 | 1.212 |
| Frid. | 15 | 17 33 33.17 | 11.081 | 23 19 6.3 | 7.00 | 16 17.72 | 71.20 | 4 22.24 | 1.221 |
| Sat. | 16 | 17 37 59.27 | 11.090 | 23 21 40.4 | 5.83 | 16 17.80 | 71.23 | 3 52.80 | 1.230 |
| *Sun.* | 17 | 17 42 25.55 | 11.098 | 23 23 46.3 | 4.66 | 16 17.88 | 71.25 | 3 23.16 | 1.237 |
| Mon. | 18 | 17 46 52.00 | 11.104 | 23 25 24.0 | 3.48 | 16 17.95 | 71.27 | 2 53.35 | 1.244 |
| Tues. | 19 | 17 51 18.55 | 11.108 | 23 26 33.4 | 2.30 | 16 18.02 | 71.29 | 2 23.43 | 1.248 |
| Wed. | 20 | 17 55 45.19 | 11.111 | 23 27 14.5 | − 1.12 | 16 18.08 | 71.30 | 1 53.43 | 1.251 |
| Thur. | 21 | 18 0 11.88 | 11.112 | 23 27 27.3 | + 0.06 | 16 18.14 | 71.31 | 1 23.39 | 1.251 |
| Frid. | 22 | 18 4 38.58 | 11.112 | 23 27 11.6 | 1.24 | 16 18.20 | 71.31 | 0 53.32 | 1.251 |
| Sat. | 23 | 18 9 5.26 | 11.110 | 23 26 27.6 | 2.42 | 16 18.25 | 71.31 | 0 23.30 | 1.249 |
| *Sun.* | 24 | 18 13 31.87 | 11.106 | 23 25 15.5 | 3.59 | 16 18.30 | 71.30 | 0 6.66 | 1.246 |
| Mon. | 25 | 18 17 58.37 | 11.102 | 23 23 35.1 | 4.77 | 16 18.34 | 71.29 | 0 36.53 | 1.241 |
| Tues. | 26 | 18 22 24.77 | 11.096 | 23 21 26.5 | 5.94 | 16 18.38 | 71.27 | 1 6.27 | 1.235 |
| Wed. | 27 | 18 26 50.98 | 11.089 | 23 18 49.8 | 7.11 | 16 18.41 | 71.25 | 1 35.85 | 1.227 |
| Thur. | 28 | 18 31 17.01 | 11.081 | 23 15 45.0 | 8.28 | 16 18.43 | 71.22 | 2 5.25 | 1.219 |
| Frid. | 29 | 18 35 42.82 | 11.071 | 23 12 12.2 | 9.44 | 16 18.45 | 71.19 | 2 34.43 | 1.208 |
| Sat. | 30 | 18 40 8.37 | 11.060 | 23 8 11.5 | 10.60 | 16 18.46 | 71.16 | 3 3.35 | 1.197 |
| *Sun.* | 31 | 18 44 33.64 | 11.048 | 23 3 43.2 | 11.76 | 16 18.46 | 71.12 | 3 31.98 | 1.186 |
| Mon. | 32 | 18 48 58.61 | 11.035 | S. 22 58 47.3 | +12.91 | 16 18.46 | 71.07 | 4 0.30 | 1.174 |

**NOTE.—Mean Time of the Semidiameter passing may be found by subtracting 0ˢ.19 from the Sidereal Time.**

**— prefixed to the hourly change of declination, indicates that south declinations are increasing.**

## AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Equation of Time, to be added to / subtracted from Mean Time. | Diff. for 1 hour. | Sidereal Time or Right Ascension of Mean Sun. |
|---|---|---|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ | m s | s | h m s |
| Frid. | 1 | 16 32 9.96 | 10.811 | S.21 55 20.4 | −22.64 | 10 34.38 | 0.955 | 16 42 44.34 |
| Sat. | 2 | 16 36 29.75 | 10.837 | 22 4 11.1 | 21.58 | 10 11.14 | 0.981 | 16 46 40.89 |
| *Sun.* | 3 | 16 40 50.14 | 10.862 | 22 12 36.4 | 20.51 | 9 47.30 | 1.006 | 16 50 37.44 |
| Mon. | 4 | 16 45 11.13 | 10.887 | 22 20 36.0 | 19.44 | 9 22.88 | 1.030 | 16 54 34.01 |
| Tues. | 5 | 16 49 32.70 | 10.910 | 22 28 9.6 | 18.35 | 8 57.87 | 1.053 | 16 58 30.57 |
| Wed. | 6 | 16 53 54.82 | 10.932 | 22 35 17.0 | 17.26 | 8 32.31 | 1.076 | 17 2 27.13 |
| Thur. | 7 | 16 58 17.45 | 10.953 | 22 41 57.9 | 16.15 | 8 6.24 | 1.097 | 17 6 23.69 |
| Frid. | 8 | 17 2 40.59 | 10.973 | 22 48 11.9 | 15.03 | 7 39.65 | 1.117 | 17 10 20.24 |
| Sat. | 9 | 17 7 4.19 | 10.992 | 22 53 59.3 | 13.90 | 7 12.60 | 1.136 | 17 14 16.79 |
| *Sun.* | 10 | 17 11 28.24 | 11.010 | 22 59 19.3 | 12.77 | 6 45.12 | 1.154 | 17 18 13.36 |
| Mon. | 11 | 17 15 52.69 | 11.027 | 23 4 12.0 | 11.63 | 6 17.23 | 1.170 | 17 22 9.92 |
| Tues. | 12 | 17 20 17.54 | 11.043 | 23 8 37.3 | 10.48 | 5 48.94 | 1.186 | 17 26 6.48 |
| Wed. | 13 | 17 24 42.72 | 11.056 | 23 12 34.9 | 9.33 | 5 20.32 | 1.199 | 17 30 3.04 |
| Thur. | 14 | 17 29 8.22 | 11.069 | 23 16 4.7 | 8.17 | 4 51.37 | 1.212 | 17 33 59.59 |
| Frid. | 15 | 17 33 33.99 | 11.078 | 23 19 6.8 | 7.00 | 4 22.15 | 1.221 | 17 37 56.14 |
| Sat. | 16 | 17 37 59.99 | 11.087 | 23 21 40.8 | 5.83 | 3 52.72 | 1.230 | 17 41 52.71 |
| *Sun.* | 17 | 17 42 26.18 | 11.094 | 23 23 46.5 | 4.66 | 3 23.09 | 1.237 | 17 45 49.27 |
| Mon. | 18 | 17 46 52.54 | 11.100 | 23 25 24.1 | 3.48 | 2 53.29 | 1.244 | 17 49 45.83 |
| Tues. | 19 | 17 51 19.00 | 11.104 | 23 26 33.4 | 2.30 | 2 23.34 | 1.248 | 17 53 42.39 |
| Wed. | 20 | 17 55 45.56 | 11.107 | 23 27 14.5 | − 1.12 | 1 53.39 | 1.251 | 17 57 38.95 |
| Thur. | 21 | 18 0 12.15 | 11.108 | 23 27 27.3 | + 0.06 | 1 23.36 | 1.251 | 18 1 35.51 |
| Frid. | 22 | 18 4 38.77 | 11.108 | 23 27 11.7 | 1.24 | 0 53.30 | 1.251 | 18 5 32.07 |
| Sat. | 23 | 18 9 5.34 | 11.106 | 23 26 27.7 | 2.42 | 0 23.29 | 1.249 | 18 9 28.63 |
| *Sun.* | 24 | 18 13 31.85 | 11.102 | 23 25 15.5 | 3.59 | 0 6.66 | 1.246 | 18 13 25.19 |
| Mon. | 25 | 18 17 58.27 | 11.098 | 23 23 35.2 | 4.77 | 0 36.52 | 1.241 | 18 17 21.75 |
| Tues. | 26 | 18 22 24.56 | 11.092 | 23 21 26.7 | 5.94 | 1 6.25 | 1.235 | 18 21 18.31 |
| Wed. | 27 | 18 26 50.69 | 11.085 | 23 18 50.0 | 7.11 | 1 35.82 | 1.227 | 18 25 14.87 |
| Thur. | 28 | 18 31 16.63 | 11.077 | 23 15 45.3 | 8.28 | 2 5.21 | 1.219 | 18 29 11.42 |
| Frid. | 29 | 18 35 42.35 | 11.067 | 23 12 12.7 | 9.44 | 2 34.38 | 1.208 | 18 33 7.97 |
| Sat. | 30 | 18 40 7.81 | 11.056 | 23 8 12.1 | 10.60 | 3 3.27 | 1.197 | 18 37 4.54 |
| *Sun.* | 31 | 18 44 32.99 | 11.044 | 23 3 43.9 | 11.75 | 3 31.91 | 1.186 | 18 41 1.10 |
| Mon. | 32 | 18 48 57.88 | 11.031 | S.22 58 48.2 | +12.90 | 4 0.22 | 1.174 | 18 44 57.66 |

**NOTE.**—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

+ prefixed to the hourly change of declination, indicates that south declinations are decreasing.

Diff. for 1 hour.
$+9^{s}.8565$

## AT GREENWICH MEAN NOON.

| Day of the Month. | Day of the Year. | THE SUN'S True LONGITUDE. λ | THE SUN'S True LONGITUDE. λ′ | Diff. for 1 hour. | LATITUDE. | Logarithm of the Radius Vector of the Earth. | Diff. for 1 hour. | Mean Time of Sidereal 0h. |
|---|---|---|---|---|---|---|---|---|
| | | ° ′ ″ | ′ ″ | ″ | ″ | | | h m s |
| 1 | 336 | 249 42 29.5 | 41 40.0 | 152.14 | +0.51 | 9.9936584 | −27.4 | 7 16 4.02 |
| 2 | 337 | 250 43 21.5 | 42 31.8 | 152.19 | 0.50 | .9935942 | 26.3 | 7 12 8.11 |
| 3 | 338 | 251 44 14.6 | 43 24.7 | 152.24 | 0.44 | .9935326 | 25.2 | 7 8 12.20 |
| 4 | 339 | 252 45 8.9 | 44 18.8 | 152.29 | 0.38 | .9934735 | 24.2 | 7 4 16.29 |
| 5 | 340 | 253 46 4.5 | 45 14.2 | 152.34 | 0.28 | .9934167 | 23.2 | 7 0 20.37 |
| 6 | 341 | 254 47 1.3 | 46 10.8 | 152.39 | 0.16 | .9933621 | 22.2 | 6 56 24.46 |
| 7 | 342 | 255 47 59.2 | 47 8.6 | 152.44 | +0.03 | .9933099 | 21.2 | 6 52 28.55 |
| 8 | 343 | 256 48 58.3 | 48 7.5 | 152.48 | −0.10 | .9932599 | 20.3 | 6 48 32.64 |
| 9 | 344 | 257 49 58.6 | 49 7.6 | 152.53 | 0.23 | .9932121 | 19.5 | 6 44 36.72 |
| 10 | 345 | 258 50 59.9 | 50 8.7 | 152.57 | 0.36 | .9931663 | 18.7 | 6 40 40.81 |
| 11 | 346 | 259 52 2.3 | 51 10.9 | 152.61 | 0.46 | .9931223 | 18.0 | 6 36 44.90 |
| 12 | 347 | 260 53 5.8 | 52 14.2 | 152.65 | 0.56 | .9930801 | 17.3 | 6 32 48.99 |
| 13 | 348 | 261 54 10.2 | 53 18.4 | 152.69 | 0.61 | .9930396 | 16.6 | 6 28 53.08 |
| 14 | 349 | 262 55 15.5 | 54 23.5 | 152.73 | 0.65 | .9930006 | 15.9 | 6 24 57.17 |
| 15 | 350 | 263 56 21.6 | 55 29.4 | 152.76 | 0.66 | .9929632 | 15.2 | 6 21 1.26 |
| 16 | 351 | 264 57 28.3 | 56 35.9 | 152.79 | 0.63 | .9929273 | 14.6 | 6 17 5.34 |
| 17 | 352 | 265 28 35.5 | 57 42.9 | 152.81 | 0.57 | .9928931 | 13.9 | 6 13 9.43 |
| 18 | 353 | 266 59 43.2 | 58 50.4 | 152.83 | 0.49 | .9928606 | 13.2 | 6 9 13.52 |
| 19 | 354 | 267 60 51.3 | 59 58.3 | 152.85 | 0.39 | .9928298 | 12.5 | 6 5 17.61 |
| 20 | 355 | 269 1 59.7 | 1 6.5 | 152.86 | 0.27 | .9928006 | 11.8 | 6 1 21.69 |
| 21 | 356 | 270 3 8.3 | 2 14.9 | 152.87 | 0.14 | .9927733 | 10.0 | 5 57 25.77 |
| 22 | 357 | 271 4 17.1 | 3 23.5 | 152.87 | −0.01 | .9927480 | 10.1 | 5 53 29.86 |
| 23 | 358 | 272 5 25.9 | 4 32.1 | 152.87 | +0.12 | .9927249 | 9.2 | 5 49 33.95 |
| 24 | 359 | 273 6 34.5 | 5 40.6 | 152.87 | 0.25 | .9927040 | 8.2 | 5 45 38.03 |
| 25 | 360 | 274 7 43.3 | 6 49.1 | 152.87 | 0.35 | .9926854 | 7.2 | 5 41 42.11 |
| 26 | 361 | 275 8 52.0 | 7 57.6 | 152.87 | 0.42 | .9926694 | 6.1 | 5 37 46.20 |
| 27 | 362 | 276 10 0.7 | 9 6.1 | 152.87 | 0.48 | .9926562 | 5.0 | 5 33 50.29 |
| 28 | 363 | 277 11 9.4 | 10 14.6 | 152.87 | 0.50 | .9926457 | 3.8 | 5 29 54.37 |
| 29 | 364 | 278 12 18.1 | 11 23.1 | 152.87 | 0.49 | .9926378 | 2.7 | 5 25 58.46 |
| 30 | 365 | 279 13 26.8 | 12 31.6 | 152.87 | 0.46 | .9926327 | 1.5 | 5 22 2.55 |
| 31 | 366 | 280 14 35.5 | 13 40.1 | 152.87 | 0.38 | .9926304 | − 0.3 | 5 18 6.64 |
| 32 | 367 | 281 15 44.3 | 14 48.7 | 152.87 | +0.29 | 9.9926311 | + 0.9 | 5 14 10.72 |

**NOTE:** λ corresponds to the *true* equinox of the date, λ′ to the *mean* equinox of January 0d.

Diff. for 1 hour.
$-9^{s}.8296$

## GREENWICH MEAN TIME.

### THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | MERIDIAN PASSAGE. | | AGE. |
|---|---|---|---|---|---|---|---|---|---|
| | Noon. | Midnight. | Noon. | Diff. for 1 hour. | Midnight. | Diff. for 1 hour. | | Diff. for 1 hour. | Noon. |
| | ′ ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ″ | h m | m | d |
| 1 | 16 28.3 | 16 31.5 | 60 20.7 | +1.13 | 60 32.3 | +0.80 | 12 20.6 | 2.75 | 15.5 |
| 2 | 16 33.6 | 16 34.5 | 60 39.9 | +0.45 | 60 43.2 | +0.11 | 13 27.2 | 2.78 | 16.5 |
| 3 | 16 34.3 | 16 33.0 | 60 42.5 | –0.23 | 60 37.7 | –0.55 | 14 32.8 | 2.65 | 17.5 |
| 4 | 16 30.7 | 16 27.5 | 60 29.4 | 0.84 | 60 17.8 | 1.09 | 15 34.0 | 2.44 | 18.5 |
| 5 | 16 23.6 | 16 19.1 | 60 3.4 | 1.30 | 59 46.7 | 1.48 | 16 29.9 | 2.22 | 19.5 |
| 6 | 16 14.0 | 16 8.7 | 59 28.2 | 1.60 | 59 8.5 | 1.68 | 17 20.8 | 2.03 | 20.5 |
| 7 | 16 3.1 | 15 57.4 | 58 48.0 | 1.73 | 58 27.2 | 1.74 | 18 8.0 | 1.91 | 21.5 |
| 8 | 15 51.7 | 15 46.2 | 58 6.4 | 1.72 | 57 45.9 | 1.69 | 18 53.1 | 1.85 | 22.5 |
| 9 | 15 40.7 | 15 35.5 | 57 25.9 | 1.64 | 57 6.6 | 1.58 | 19 37.5 | 1.85 | 23.5 |
| 10 | 15 30.4 | 15 25.6 | 56 48.1 | 1.50 | 56 30.5 | 1.43 | 20 22.4 | 1.90 | 24.5 |
| 11 | 15 21.1 | 15 16.8 | 56 13.8 | 1.36 | 55 57.9 | 1.28 | 21 8.9 | 1.98 | 25.5 |
| 12 | 15 12.7 | 15 8.9 | 55 43.0 | 1.20 | 55 29.1 | 1.13 | 21 57.6 | 2.08 | 26.5 |
| 13 | 15 5.4 | 15 2.0 | 55 16.0 | 1.05 | 55 3.8 | 0.98 | 22 48.6 | 2.16 | 27.5 |
| 14 | 14 59.0 | 14 56.1 | 54 52.4 | 0.91 | 54 42.0 | 0.82 | 23 40.9 | 2.20 | 28.5 |
| 15 | 14 53.6 | 14 51.3 | 54 32.6 | 0.75 | 54 24.1 | 0.66 | 6 | | 29.5 |
| 16 | 14 49.2 | 14 47.5 | 54 16.7 | 0.57 | 54 10.5 | 0.47 | 0 33.4 | 2.17 | 0.7 |
| 17 | 14 46.2 | 14 45.2 | 54 5.5 | 0.36 | 54 1.8 | –0.25 | 1 24.7 | 2.09 | 1.7 |
| 18 | 14 44.6 | 14 44.4 | 53 59.6 | –0.11 | 53 59.1 | +0.03 | 2 13.6 | 1.98 | 2.7 |
| 19 | 14 44.8 | 14 45.6 | 54 0.3 | +0.18 | 54 3.4 | 0.35 | 2 59.7 | 1.86 | 3.7 |
| 20 | 14 47.0 | 14 49.0 | 54 8.6 | 0.52 | 54 15.9 | 0.70 | 3 43.2 | 1.76 | 4.7 |
| 21 | 14 51.6 | 14 54.8 | 54 25.4 | 0.89 | 54 37.2 | 1.08 | 4 24.6 | 1.70 | 5.7 |
| 22 | 14 58.7 | 15 3.2 | 54 51.4 | 1.28 | 55 8.0 | 1.48 | 5 5.0 | 1.68 | 6.7 |
| 23 | 15 8.4 | 15 14.1 | 55 27.0 | 1.68 | 55 48.2 | 1.86 | 5 45.5 | 1.71 | 7.7 |
| 24 | 15 20.5 | 15 27.4 | 56 11.5 | 2.03 | 56 36.8 | 2.18 | 6 27.4 | 1.79 | 8.7 |
| 25 | 15 34.7 | 15 42.4 | 57 3.8 | 2.31 | 57 32.2 | 2.41 | 7 12.2 | 1.96 | 9.7 |
| 26 | 15 50.4 | 15 58.5 | 58 1.5 | 2.46 | 58 31.1 | 2.46 | 8 1.3 | 2.16 | 10.7 |
| 27 | 16 6.5 | 16 14.2 | 59 0.4 | 2.41 | 59 28.8 | 2.30 | 8 56.1 | 2.42 | 11.7 |
| 28 | 16 21.4 | 16 28.0 | 59 55.4 | 2.13 | 60 19.6 | 1.89 | 9 56.9 | 2.67 | 12.7 |
| 29 | 16 33.8 | 16 38.4 | 60 40.6 | 1.60 | 60 57.8 | 1.26 | 11 3.0 | 2.81 | 13.7 |
| 30 | 16 42.0 | 16 44.1 | 61 10.7 | 0.87 | 61 18.8 | +0.47 | 12 10.6 | 2.79 | 14.7 |
| 31 | 16 45.0 | 16 44.5 | 61 22.0 | +0.05 | 61 20.0 | –0.37 | 13 16.1 | 2.64 | 15.7 |
| 32 | 16 42.6 | 16 39.5 | 61 13.3 | –0.76 | 61 1.8 | –1.14 | 14 16.8 | 2.41 | 16.7 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | FRIDAY 1. | | | | | SUNDAY 3. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 4 31 13.15 | 2.7264 | N.26 55 20.1 | 5.890 | 0 | 6 45 42.26 | 2.7891 | N.27 36 31.8 | 4.301 |
| 1 | 4 33 56.93 | 2.7328 | 27 1 7.7 | 5.696 | 1 | 6 48 29.48 | 2.7848 | 27 32 7.5 | 4.509 |
| 2 | 4 36 41.09 | 2.7390 | 27 6 43.6 | 5.500 | 2 | 6 51 16.44 | 2.7803 | 27 27 30.7 | 4.717 |
| 3 | 4 39 25.61 | 2.7450 | 27 12 7.7 | 5.302 | 3 | 6 54 3.12 | 2.7757 | 27 22 41.5 | 4.923 |
| 4 | 4 42 10.49 | 2.7509 | 27 17 19.9 | 5.103 | 4 | 6 56 49.52 | 2.7708 | 27 17 40.0 | 5.127 |
| 5 | 4 44 55.72 | 2.7566 | 27 22 20.1 | 4.903 | 5 | 6 59 35.62 | 2.7657 | 27 12 26.3 | 5.330 |
| 6 | 4 47 41.28 | 2.7621 | 27 27 8.3 | 4.702 | 6 | 7 2 21.41 | 2.7605 | 27 7 0.4 | 5.532 |
| 7 | 4 50 27.17 | 2.7673 | 27 31 44.4 | 4.500 | 7 | 7 5 6.88 | 2.7551 | 27 1 22.4 | 5.733 |
| 8 | 4 53 13.36 | 2.7723 | 27 36 8.3 | 4.296 | 8 | 7 7 52.02 | 2.7495 | 26 55 32.4 | 5.932 |
| 9 | 4 55 59.85 | 2.7772 | 27 40 19.9 | 4.090 | 9 | 7 10 36.82 | 2.7437 | 26 49 30.6 | 6.128 |
| 10 | 4 58 46.63 | 2.7819 | 27 44 19.1 | 3.883 | 10 | 7 13 21.27 | 2.7377 | 26 43 17.0 | 6.324 |
| 11 | 5 1 33.68 | 2.7864 | 27 48 5.9 | 3.676 | 11 | 7 16 5.35 | 2.7316 | 26 36 51.7 | 6.519 |
| 12 | 5 4 21.00 | 2.7907 | 27 51 40.2 | 3.467 | 12 | 7 18 49.06 | 2.7253 | 26 30 14.7 | 6.712 |
| 13 | 5 7 8.57 | 2.7947 | 27 55 1.9 | 3.257 | 13 | 7 21 32.39 | 2.7190 | 26 23 26.2 | 6.903 |
| 14 | 5 9 56.37 | 2.7985 | 27 58 11.0 | 3.046 | 14 | 7 24 15.34 | 2.7125 | 26 16 26.3 | 7.092 |
| 15 | 5 12 44.39 | 2.8022 | 28 1 7.4 | 2.833 | 15 | 7 26 57.89 | 2.7058 | 26 9 15.1 | 7.280 |
| 16 | 5 15 32.63 | 2.8056 | 28 3 51.0 | 2.619 | 16 | 7 29 40.03 | 2.6989 | 26 1 52.7 | 7.467 |
| 17 | 5 18 21.06 | 2.8087 | 28 6 21.7 | 2.405 | 17 | 7 32 21.76 | 2.6920 | 25 54 19.1 | 7.652 |
| 18 | 5 21 9.67 | 2.8116 | 28 8 39.6 | 2.191 | 18 | 7 35 3.07 | 2.6849 | 25 46 34.5 | 7.834 |
| 19 | 5 23 58.45 | 2.8143 | 28 10 44.6 | 1.976 | 19 | 7 37 43.95 | 2.6777 | 25 38 39.0 | 8.014 |
| 20 | 5 26 47.39 | 2.8168 | 28 12 36.7 | 1.761 | 20 | 7 40 24.40 | 2.6704 | 25 30 32.8 | 8.193 |
| 21 | 5 29 36.47 | 2.8190 | 28 14 15.9 | 1.544 | 21 | 7 43 4.40 | 2.6629 | 25 22 15.9 | 8.370 |
| 22 | 5 32 25.67 | 2.8209 | 28 15 42.0 | 1.327 | 22 | 7 45 43.95 | 2.6554 | 25 13 48.4 | 8.545 |
| 23 | 5 35 14.98 | 2.8227 | N.28 16 55.1 | 1.109 | 23 | 7 48 23.05 | 2.6478 | N.25 5 10.5 | 8.717 |
| | SATURDAY 2. | | | | | MONDAY 4. | | | |
| 0 | 5 38 4.39 | 2.8243 | N.28 17 55.1 | 0.891 | 0 | 7 51 1.69 | 2.6402 | N.24 56 22.3 | 8.888 |
| 1 | 5 40 53.89 | 2.8256 | 28 18 42.0 | 0.672 | 1 | 7 53 39.87 | 2.6323 | 24 47 23.9 | 9.057 |
| 2 | 5 43 43.46 | 2.8266 | 28 19 15.8 | 0.454 | 2 | 7 56 17.57 | 2.6243 | 24 38 15.4 | 9.225 |
| 3 | 5 46 33.08 | 2.8273 | 28 19 36.5 | 0.235 | 3 | 7 58 54.79 | 2.6163 | 24 28 56.9 | 9.390 |
| 4 | 5 49 22.74 | 2.8279 | 28 19 44.0 | +0.016 | 4 | 8 1 31.53 | 2.6083 | 24 19 28.6 | 9.552 |
| 5 | 5 52 12.43 | 2.8282 | 28 19 38.4 | −0.203 | 5 | 8 4 7.79 | 2.6002 | 24 9 50.6 | 9.712 |
| 6 | 5 55 2.13 | 2.8283 | 28 19 19.7 | 0.422 | 6 | 8 6 43.56 | 2.5920 | 24 0 3.1 | 9.871 |
| 7 | 5 57 51.83 | 2.8282 | 28 18 47.8 | 0.641 | 7 | 8 9 18.83 | 2.5837 | 23 50 6.1 | 10.028 |
| 8 | 6 0 41.51 | 2.8278 | 28 18 2.8 | 0.860 | 8 | 8 11 53.60 | 2.5753 | 23 39 59.7 | 10.183 |
| 9 | 6 3 31.16 | 2.8271 | 28 17 4.6 | 1.079 | 9 | 8 14 27.87 | 2.5670 | 23 29 44.1 | 10.336 |
| 10 | 6 6 20.76 | 2.8261 | 28 15 53.3 | 1.298 | 10 | 8 17 1.64 | 2.5587 | 23 19 19.4 | 10.486 |
| 11 | 6 9 10.29 | 2.8248 | 28 14 28.9 | 1.517 | 11 | 8 19 34.91 | 2.5503 | 23 8 45.8 | 10.634 |
| 12 | 6 11 59.74 | 2.8234 | 28 12 51.3 | 1.736 | 12 | 8 22 7.67 | 2.5418 | 22 58 3.3 | 10.781 |
| 13 | 6 14 49.10 | 2.8218 | 28 11 0.6 | 1.953 | 13 | 8 24 39.92 | 2.5333 | 22 47 12.1 | 10.924 |
| 14 | 6 17 38.36 | 2.8201 | 28 8 56.9 | 2.169 | 14 | 8 27 11.66 | 2.5248 | 22 36 12.4 | 11.065 |
| 15 | 6 20 27.51 | 2.8181 | 28 6 40.3 | 2.385 | 15 | 8 29 42.89 | 2.5162 | 22 25 4.3 | 11.205 |
| 16 | 6 23 16.53 | 2.8158 | 28 4 10.7 | 2.601 | 16 | 8 32 13.60 | 2.5076 | 22 13 47.8 | 11.343 |
| 17 | 6 26 5.40 | 2.8132 | 28 1 28.2 | 2.816 | 17 | 8 34 43.80 | 2.4991 | 22 2 23.2 | 11.478 |
| 18 | 6 28 54.11 | 2.8103 | 27 58 32.8 | 3.031 | 18 | 8 37 13.49 | 2.4905 | 21 50 50.5 | 11.611 |
| 19 | 6 31 42.64 | 2.8073 | 27 55 24.5 | 3.245 | 19 | 8 39 42.66 | 2.4818 | 21 39 9.9 | 11.742 |
| 20 | 6 34 30.99 | 2.8042 | 27 52 3.4 | 3.458 | 20 | 8 42 11.31 | 2.4733 | 21 27 21.5 | 11.871 |
| 21 | 6 37 19.14 | 2.8008 | 27 48 29.5 | 3.671 | 21 | 8 44 39.45 | 2.4647 | 21 15 25.4 | 11.997 |
| 22 | 6 40 7.08 | 2.7971 | 27 44 42.9 | 3.882 | 22 | 8 47 7.07 | 2.4561 | 21 3 21.8 | 12.121 |
| 23 | 6 42 54.79 | 2.7932 | 27 40 43.6 | 4.092 | 23 | 8 49 34.18 | 2.4476 | 20 51 10.9 | 12.242 |
| 24 | 6 45 42.26 | 2.7891 | N.27 36 31.8 | 4.301 | 24 | 8 52 0.78 | 2.4390 | N.20 38 52.8 | 12.362 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### TUESDAY 5.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
|  | h m s | s | ° ′ ″ | ″ |
| 0 | 8 52 0.78 | 2.4390 | N.20 38 52.8 | 12.362 |
| 1 | 8 54 26.86 | 2.4304 | 20 26 27.5 | 12.480 |
| 2 | 8 56 52.43 | 2.4219 | 20 13 55.2 | 12.596 |
| 3 | 8 59 17.49 | 2.4134 | 20 1 16.0 | 12.710 |
| 4 | 9 1 42.04 | 2.4049 | 19 48 30.0 | 12.822 |
| 5 | 9 4 6.08 | 2.3964 | 19 35 37.4 | 12.931 |
| 6 | 9 6 29.61 | 2.3880 | 19 22 38.3 | 13.038 |
| 7 | 9 8 52.64 | 2.3797 | 19 9 32.8 | 13.143 |
| 8 | 9 11 15.17 | 2.3714 | 18 56 21.1 | 13.246 |
| 9 | 9 13 37.20 | 2.3631 | 18 43 3.3 | 13.347 |
| 10 | 9 15 58.74 | 2.3548 | 18 29 39.5 | 13.445 |
| 11 | 9 18 19.78 | 2.3466 | 18 16 9.9 | 13.542 |
| 12 | 9 20 40.33 | 2.3384 | 18 2 34.5 | 13.637 |
| 13 | 9 23 0.39 | 2.3303 | 17 48 53.5 | 13.729 |
| 14 | 9 25 19.97 | 2.3223 | 17 35 7.0 | 13.819 |
| 15 | 9 27 39.07 | 2.3144 | 17 21 15.2 | 13.907 |
| 16 | 9 29 57.70 | 2.3066 | 17 7 18.1 | 13.994 |
| 17 | 9 32 15.86 | 2.2987 | 16 53 15.9 | 14.079 |
| 18 | 9 34 33.54 | 2.2908 | 16 39 8.6 | 14.162 |
| 19 | 9 36 50.75 | 2.2830 | 16 24 56.4 | 14.242 |
| 20 | 9 39 7.50 | 2.2754 | 16 10 39.5 | 14.320 |
| 21 | 9 41 23.80 | 2.2679 | 15 56 18.0 | 14.396 |
| 22 | 9 43 39.65 | 2.2604 | 15 41 52.0 | 14.471 |
| 23 | 9 45 55.05 | 2.2529 | N.15 27 21.5 | 14.544 |

### WEDNESDAY 6.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 9 48 10.00 | 2.2455 | N.15 12 46.7 | 14.615 |
| 1 | 9 50 24.51 | 2.2382 | 14 58 7.7 | 14.684 |
| 2 | 9 52 38.59 | 2.2311 | 14 43 24.6 | 14.751 |
| 3 | 9 54 52.24 | 2.2240 | 14 28 37.6 | 14.816 |
| 4 | 9 57 5.47 | 2.2170 | 14 13 46.7 | 14.880 |
| 5 | 9 59 18.28 | 2.2100 | 13 58 52.0 | 14.942 |
| 6 | 10 1 30.67 | 2.2030 | 13 43 53.7 | 15.001 |
| 7 | 10 3 42.64 | 2.1962 | 13 28 51.9 | 15.059 |
| 8 | 10 5 54.21 | 2.1896 | 13 13 46.6 | 15.116 |
| 9 | 10 8 5.39 | 2.1830 | 12 58 38.0 | 15.170 |
| 10 | 10 10 16.17 | 2.1764 | 12 43 26.2 | 15.222 |
| 11 | 10 12 26.56 | 2.1699 | 12 28 11.3 | 15.273 |
| 12 | 10 14 36.56 | 2.1635 | 12 12 53.4 | 15.322 |
| 13 | 10 16 46.18 | 2.1573 | 11 57 32.6 | 15.370 |
| 14 | 10 18 55.43 | 2.1512 | 11 42 9.0 | 15.417 |
| 15 | 10 21 4.32 | 2.1452 | 11 26 42.6 | 15.462 |
| 16 | 10 23 12.85 | 2.1392 | 11 11 13.6 | 15.503 |
| 17 | 10 25 21.02 | 2.1333 | 10 55 42.2 | 15.543 |
| 18 | 10 27 28.84 | 2.1275 | 10 40 8.4 | 15.583 |
| 19 | 10 29 36.32 | 2.1218 | 10 24 32.3 | 15.621 |
| 20 | 10 31 43.45 | 2.1161 | 10 8 53.9 | 15.657 |
| 21 | 10 33 50.25 | 2.1106 | 9 53 13.4 | 15.692 |
| 22 | 10 35 56.72 | 2.1052 | 9 37 30.9 | 15.725 |
| 23 | 10 38 2.87 | 2.0998 | 9 21 46.4 | 15.757 |
| 24 | 10 40 8.70 | 2.0946 | N. 9 6 0.1 | 15.787 |

### THURSDAY 7.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
|  | h m s | s | ° ′ ″ | ″ |
| 0 | 10 40 8.70 | 2.0946 | N. 9 6 0.1 | 15.787 |
| 1 | 10 42 14.22 | 2.0895 | 8 50 12.0 | 15.815 |
| 2 | 10 44 19.44 | 2.0845 | 8 34 22.3 | 15.841 |
| 3 | 10 46 24.36 | 2.0795 | 8 18 31.1 | 15.866 |
| 4 | 10 48 28.98 | 2.0747 | 8 2 38.4 | 15.890 |
| 5 | 10 50 33.32 | 2.0700 | 7 46 44.3 | 15.913 |
| 6 | 10 52 37.38 | 2.0653 | 7 30 48.8 | 15.935 |
| 7 | 10 54 41.16 | 2.0607 | 7 14 52.1 | 15.954 |
| 8 | 10 56 44.67 | 2.0563 | 6 58 54.3 | 15.972 |
| 9 | 10 58 47.92 | 2.0520 | 6 42 55.5 | 15.988 |
| 10 | 11 0 50.91 | 2.0478 | 6 26 55.7 | 16.004 |
| 11 | 11 2 53.65 | 2.0437 | 6 10 55.0 | 16.017 |
| 12 | 11 4 56.15 | 2.0397 | 5 54 53.6 | 16.029 |
| 13 | 11 6 58.41 | 2.0357 | 5 38 51.5 | 16.041 |
| 14 | 11 9 0.43 | 2.0318 | 5 22 48.7 | 16.052 |
| 15 | 11 11 2.22 | 2.0280 | 5 6 45.3 | 16.061 |
| 16 | 11 13 3.79 | 2.0243 | 4 50 41.4 | 16.068 |
| 17 | 11 15 5.14 | 2.0207 | 4 34 37.1 | 16.074 |
| 18 | 11 17 6.28 | 2.0173 | 4 18 32.5 | 16.078 |
| 19 | 11 19 7.22 | 2.0140 | 4 2 27.7 | 16.082 |
| 20 | 11 21 7.96 | 2.0107 | 3 46 22.7 | 16.084 |
| 21 | 11 23 8.50 | 2.0075 | 3 30 17.6 | 16.085 |
| 22 | 11 25 8.86 | 2.0045 | 3 14 12.5 | 16.084 |
| 23 | 11 27 9.04 | 2.0015 | N. 2 58 7.5 | 16.082 |

### FRIDAY 8.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 11 29 9.04 | 1.9986 | N. 2 42 2.6 | 16.080 |
| 1 | 11 31 8.87 | 1.9958 | 2 25 57.9 | 16.076 |
| 2 | 11 33 8.54 | 1.9932 | 2 9 53.5 | 16.071 |
| 3 | 11 35 8.05 | 1.9906 | 1 53 49.4 | 16.064 |
| 4 | 11 37 7.41 | 1.9681 | 1 37 45.8 | 16.056 |
| 5 | 11 39 6.62 | 1.9857 | 1 21 42.7 | 16.047 |
| 6 | 11 41 5.69 | 1.9833 | 1 5 40.1 | 16.038 |
| 7 | 11 43 4.62 | 1.9811 | 0 49 38.1 | 16.027 |
| 8 | 11 45 3.42 | 1.9790 | 0 33 36.8 | 16.015 |
| 9 | 11 47 2.10 | 1.9770 | 0 17 36.3 | 16.001 |
| 10 | 11 49 0.66 | 1.9751 | N. 0 1 36.7 | 15.986 |
| 11 | 11 50 59.11 | 1.9732 | S. 0 14 22.0 | 15.971 |
| 12 | 11 52 57.45 | 1.9715 | 0 30 19.8 | 15.955 |
| 13 | 11 54 55.69 | 1.9698 | 0 46 16.6 | 15.937 |
| 14 | 11 56 53.83 | 1.9682 | 1 2 12.2 | 15.917 |
| 15 | 11 58 51.88 | 1.9668 | 1 18 6.6 | 15.897 |
| 16 | 12 0 49.85 | 1.9655 | 1 33 59.8 | 15.875 |
| 17 | 12 2 47.74 | 1.9642 | 1 49 51.6 | 15.852 |
| 18 | 12 4 45.55 | 1.9629 | 2 5 42.1 | 15.830 |
| 19 | 12 6 43.29 | 1.9618 | 2 21 31.2 | 15.807 |
| 20 | 12 8 40.97 | 1.9608 | 2 37 18.9 | 15.782 |
| 21 | 12 10 38.59 | 1.9599 | 2 53 5.0 | 15.754 |
| 22 | 12 12 36.16 | 1.9591 | 3 8 49.4 | 15.725 |
| 23 | 12 14 33.68 | 1.9583 | 3 24 32.0 | 15.696 |
| 24 | 12 16 31.16 | 1.9577 | S. 3 40 12.9 | 15.667 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SATURDAY 9.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 12 16 31.16 | 1.9577 | S. 3 40 12.9 | 15.667 |
| 1 | 12 18 28.60 | 1.9571 | 3 55 52.0 | 15.636 |
| 2 | 12 20 26.01 | 1.9566 | 4 11 29.2 | 15.604 |
| 3 | 12 22 23.39 | 1.9562 | 4 27 4.5 | 15.572 |
| 4 | 12 24 20.75 | 1.9558 | 4 42 37.8 | 15.538 |
| 5 | 12 26 18.09 | 1.9556 | 4 58 9.0 | 15.503 |
| 6 | 12 28 15.42 | 1.9555 | 5 13 38.1 | 15.468 |
| 7 | 12 30 12.75 | 1.9555 | 5 29 5.1 | 15.431 |
| 8 | 12 32 10.08 | 1.9555 | 5 44 29.8 | 15.392 |
| 9 | 12 34 7.41 | 1.9556 | 5 59 52.1 | 15.352 |
| 10 | 12 36 4.75 | 1.9557 | 6 15 12.0 | 15.312 |
| 11 | 12 38 2.10 | 1.9559 | 6 30 29.5 | 15.271 |
| 12 | 12 39 59.46 | 1.9562 | 6 45 44.5 | 15.229 |
| 13 | 12 41 56.85 | 1.9567 | 7 0 57.0 | 15.187 |
| 14 | 12 43 54.27 | 1.9572 | 7 16 6.9 | 15.143 |
| 15 | 12 45 51.72 | 1.9578 | 7 31 14.1 | 15.097 |
| 16 | 12 47 49.21 | 1.9585 | 7 46 18.5 | 15.051 |
| 17 | 12 49 46.74 | 1.9592 | 8 1 20.2 | 15.004 |
| 18 | 12 51 44.31 | 1.9599 | 8 16 19.0 | 14.956 |
| 19 | 12 53 41.93 | 1.9608 | 8 31 14.9 | 14.907 |
| 20 | 12 55 39.61 | 1.9618 | 8 46 7.8 | 14.856 |
| 21 | 12 57 37.35 | 1.9629 | 9 0 57.6 | 14.805 |
| 22 | 12 59 35.16 | 1.9641 | 9 15 44.4 | 14.754 |
| 23 | 13 1 33.04 | 1.9653 | S. 9 30 28.1 | 14.702 |

### SUNDAY 10.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 13 3 30.99 | 1.9665 | S. 9 45 8.6 | 14.648 |
| 1 | 13 5 29.02 | 1.9678 | 9 59 45.8 | 14.592 |
| 2 | 13 7 27.13 | 1.9692 | 10 14 19.6 | 14.536 |
| 3 | 13 9 25.32 | 1.9706 | 10 28 50.1 | 14.480 |
| 4 | 13 11 23.60 | 1.9721 | 10 43 17.2 | 14.422 |
| 5 | 13 13 21.97 | 1.9737 | 10 57 40.8 | 14.363 |
| 6 | 13 15 20.44 | 1.9754 | 11 12 0.8 | 14.303 |
| 7 | 13 17 19.02 | 1.9772 | 11 26 17.2 | 14.242 |
| 8 | 13 19 17.71 | 1.9791 | 11 40 29.9 | 14.181 |
| 9 | 13 21 16.51 | 1.9809 | 11 54 38.9 | 14.118 |
| 10 | 13 23 15.42 | 1.9828 | 12 8 44.1 | 14.055 |
| 11 | 13 25 14.45 | 1.9848 | 12 22 45.5 | 13.991 |
| 12 | 13 27 13.60 | 1.9869 | 12 36 43.0 | 13.925 |
| 13 | 13 29 12.88 | 1.9890 | 12 50 36.5 | 13.858 |
| 14 | 13 31 12.28 | 1.9911 | 13 4 26.0 | 13.791 |
| 15 | 13 33 11.81 | 1.9933 | 13 18 11.4 | 13.722 |
| 16 | 13 35 11.48 | 1.9957 | 13 31 52.7 | 13.653 |
| 17 | 13 37 11.30 | 1.9981 | 13 45 29.8 | 13.583 |
| 18 | 13 39 11.26 | 2.0005 | 13 59 2.7 | 13.512 |
| 19 | 13 41 11.36 | 2.0029 | 14 12 31.3 | 13.440 |
| 20 | 13 43 11.61 | 2.0055 | 14 25 55.5 | 13.367 |
| 21 | 13 45 12.02 | 2.0081 | 14 39 15.3 | 13.293 |
| 22 | 13 47 12.58 | 2.0107 | 14 52 30.6 | 13.218 |
| 23 | 13 49 13.30 | 2.0134 | 15 5 41.4 | 13.142 |
| 24 | 13 51 14.19 | 2.0162 | S. 15 18 47.6 | 13.064 |

### MONDAY 11.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 13 51 14.19 | 2.0162 | S. 15 18 47.6 | 13.064 |
| 1 | 13 53 15.24 | 2.0189 | 15 31 49.1 | 12.987 |
| 2 | 13 55 16.46 | 2.0218 | 15 44 46.0 | 12.908 |
| 3 | 13 57 17.85 | 2.0247 | 15 57 38.1 | 12.828 |
| 4 | 13 59 19.42 | 2.0276 | 16 10 25.4 | 12.747 |
| 5 | 14 1 21.16 | 2.0305 | 16 23 7.8 | 12.666 |
| 6 | 14 3 23.08 | 2.0335 | 16 35 45.3 | 12.583 |
| 7 | 14 5 25.18 | 2.0366 | 16 48 17.8 | 12.500 |
| 8 | 14 7 27.47 | 2.0397 | 17 0 45.3 | 12.415 |
| 9 | 14 9 29.94 | 2.0428 | 17 13 7.6 | 12.328 |
| 10 | 14 11 32.60 | 2.0459 | 17 25 24.7 | 12.242 |
| 11 | 14 13 35.45 | 2.0491 | 17 37 36.6 | 12.155 |
| 12 | 14 15 38.50 | 2.0524 | 17 49 43.3 | 12.067 |
| 13 | 14 17 41.74 | 2.0557 | 18 1 44.7 | 11.978 |
| 14 | 14 19 45.18 | 2.0590 | 18 13 40.7 | 11.887 |
| 15 | 14 21 48.82 | 2.0623 | 18 25 31.2 | 11.796 |
| 16 | 14 23 52.66 | 2.0657 | 18 37 16.2 | 11.704 |
| 17 | 14 25 56.71 | 2.0692 | 18 48 55.7 | 11.612 |
| 18 | 14 28 0.96 | 2.0726 | 19 0 29.6 | 11.518 |
| 19 | 14 30 5.42 | 2.0760 | 19 11 57.8 | 11.422 |
| 20 | 14 32 10.08 | 2.0794 | 19 23 20.2 | 11.326 |
| 21 | 14 34 14.95 | 2.0829 | 19 34 36.9 | 11.230 |
| 22 | 14 36 20.03 | 2.0864 | 19 45 47.8 | 11.132 |
| 23 | 14 38 25.32 | 2.0900 | S. 19 56 52.8 | 11.033 |

### TUESDAY 12.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 14 40 30.83 | 2.0936 | S. 20 7 51.8 | 10.933 |
| 1 | 14 42 36.55 | 2.0972 | 20 18 44.8 | 10.833 |
| 2 | 14 44 42.49 | 2.1007 | 20 29 31.8 | 10.732 |
| 3 | 14 46 48.64 | 2.1043 | 20 40 12.7 | 10.630 |
| 4 | 14 48 55.01 | 2.1079 | 20 50 47.4 | 10.527 |
| 5 | 14 51 1.59 | 2.1115 | 21 1 15.9 | 10.422 |
| 6 | 14 53 8.39 | 2.1152 | 21 11 38.1 | 10.317 |
| 7 | 14 55 15.41 | 2.1188 | 21 21 54.0 | 10.211 |
| 8 | 14 57 22.65 | 2.1225 | 21 32 3.5 | 10.104 |
| 9 | 14 59 30.11 | 2.1261 | 21 42 6.5 | 9.997 |
| 10 | 15 1 37.79 | 2.1297 | 21 52 3.1 | 9.889 |
| 11 | 15 3 45.68 | 2.1333 | 22 1 53.2 | 9.780 |
| 12 | 15 5 53.79 | 2.1370 | 22 11 36.7 | 9.669 |
| 13 | 15 8 2.12 | 2.1407 | 22 21 13.5 | 9.557 |
| 14 | 15 10 10.67 | 2.1443 | 22 30 43.6 | 9.445 |
| 15 | 15 12 19.44 | 2.1479 | 22 40 6.9 | 9.333 |
| 16 | 15 14 28.42 | 2.1515 | 22 49 23.5 | 9.220 |
| 17 | 15 16 37.62 | 2.1551 | 22 58 33.3 | 9.106 |
| 18 | 15 18 47.03 | 2.1587 | 23 7 36.2 | 8.990 |
| 19 | 15 20 56.66 | 2.1622 | 23 16 32.1 | 8.874 |
| 20 | 15 23 6.50 | 2.1657 | 23 25 21.0 | 8.757 |
| 21 | 15 25 16.55 | 2.1693 | 23 34 2.9 | 8.639 |
| 22 | 15 27 26.82 | 2.1729 | 23 42 37.7 | 8.520 |
| 23 | 15 29 37.30 | 2.1763 | 23 51 5.3 | 8.400 |
| 24 | 15 31 47.98 | 2.1798 | S. 23 59 25.7 | 8.280 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | WEDNESDAY 13. | | | | | FRIDAY 15. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 15 31 47.98 | 2.1798 | S.23 59 25.7 | 8.280 | 0 | 17 19 30.97 | 2.2823 | S.28 6 6.8 | 1.817 |
| 1 | 15 33 58.87 | 2.1833 | 24 7 38.9 | 8.159 | 1 | 17 21 47.92 | 2.2826 | 28 7 51.5 | 1.673 |
| 2 | 15 36 9.97 | 2.1867 | 24 15 44.8 | 8.037 | 2 | 17 24 4.88 | 2.2828 | 28 9 27.6 | 1.530 |
| 3 | 15 38 21.27 | 2.1901 | 24 23 43.4 | 7.915 | 3 | 17 26 21.85 | 2.2828 | 28 10 55.1 | 1.387 |
| 4 | 15 40 32.78 | 2.1935 | 24 31 34.6 | 7.792 | 4 | 17 28 38.82 | 2.2827 | 28 12 14.0 | 1.244 |
| 5 | 15 42 44.49 | 2.1967 | 24 39 18.4 | 7.667 | 5 | 17 30 55.78 | 2.2826 | 28 13 24.4 | 1.102 |
| 6 | 15 44 56.39 | 2.1999 | 24 46 54.7 | 7.542 | 6 | 17 33 12.73 | 2.2823 | 28 14 26.2 | 0.958 |
| 7 | 15 47 8.48 | 2.2032 | 24 54 23.5 | 7.417 | 7 | 17 35 29.66 | 2.2820 | 28 15 19.4 | 0.815 |
| 8 | 15 49 20.77 | 2.2064 | 25 1 44.8 | 7.292 | 8 | 17 37 46.57 | 2.2816 | 28 16 4.0 | 0.672 |
| 9 | 15 51 33.25 | 2.2096 | 25 8 58.5 | 7.165 | 9 | 17 40 3.45 | 2.2811 | 28 16 40.1 | 0.530 |
| 10 | 15 53 45.92 | 2.2127 | 25 16 4.6 | 7.037 | 10 | 17 42 20.30 | 2.2804 | 28 17 7.6 | 0.387 |
| 11 | 15 55 58.77 | 2.2157 | 25 23 3.0 | 6.908 | 11 | 17 44 37.10 | 2.2796 | 28 17 26.5 | 0.244 |
| 12 | 15 58 11.80 | 2.2187 | 25 29 53.6 | 6.779 | 12 | 17 46 53.85 | 2.2788 | 28 17 36.9 | −0.102 |
| 13 | 16 0 25.01 | 2.2217 | 25 36 36.5 | 6.650 | 13 | 17 49 10.55 | 2.2779 | 28 17 38.7 | +0.041 |
| 14 | 16 2 38.40 | 2.2247 | 25 43 11.6 | 6.520 | 14 | 17 51 27.20 | 2.2769 | 28 17 32.0 | 0.183 |
| 15 | 16 4 51.97 | 2.2276 | 25 49 38.9 | 6.389 | 15 | 17 53 43.78 | 2.2758 | 28 17 16.8 | 0.324 |
| 16 | 16 7 5.71 | 2.2304 | 25 55 58.3 | 6.258 | 16 | 17 56 0.29 | 2.2746 | 28 16 53.1 | 0.466 |
| 17 | 16 9 19.62 | 2.2332 | 26 2 9.8 | 6.126 | 17 | 17 58 16.73 | 2.2733 | 28 16 20.9 | 0.607 |
| 18 | 16 11 33.69 | 2.2358 | 26 8 13.4 | 5.993 | 18 | 18 0 33.09 | 2.2719 | 28 15 40.2 | 0.748 |
| 19 | 16 13 47.92 | 2.2384 | 26 14 9.0 | 5.859 | 19 | 18 2 49.36 | 2.2704 | 28 14 51.1 | 0.889 |
| 20 | 16 16 2.30 | 2.2409 | 26 19 56.5 | 5.725 | 20 | 18 5 5.54 | 2.2688 | 28 13 53.5 | 1.030 |
| 21 | 16 18 16.83 | 2.2434 | 26 25 36.0 | 5.592 | 21 | 18 7 21.62 | 2.2672 | 28 12 47.5 | 1.171 |
| 22 | 16 20 31.51 | 2.2459 | 26 31 7.5 | 5.458 | 22 | 18 9 37.60 | 2.2654 | 28 11 33.0 | 1.312 |
| 23 | 16 22 46.34 | 2.2483 | S.26 36 30.9 | 5.322 | 23 | 18 11 53.47 | 2.2636 | S.28 10 10.1 | 1.451 |
| | THURSDAY 14. | | | | | SATURDAY 16. | | | |
| 0 | 16 25 1.31 | 2.2507 | S.26 41 46.1 | 5.185 | 0 | 18 14 9.23 | 2.2617 | S.28 8 38.9 | 1.590 |
| 1 | 16 27 16.42 | 2.2529 | 26 46 53.1 | 5.048 | 1 | 18 16 24.87 | 2.2597 | 28 6 59.3 | 1.729 |
| 2 | 16 29 31.66 | 2.2550 | 26 51 51.9 | 4.912 | 2 | 18 18 40.39 | 2.2576 | 28 5 11.4 | 1.868 |
| 3 | 16 31 47.02 | 2.2571 | 26 56 42.5 | 4.775 | 3 | 18 20 55.78 | 2.2553 | 28 3 15.2 | 2.006 |
| 4 | 16 34 2.51 | 2.2592 | 27 1 24.9 | 4.637 | 4 | 18 23 11.03 | 2.2530 | 28 1 10.7 | 2.143 |
| 5 | 16 36 18.12 | 2.2612 | 27 5 59.0 | 4.499 | 5 | 18 25 26.14 | 2.2507 | 27 58 58.0 | 2.281 |
| 6 | 16 38 33.85 | 2.2631 | 27 10 24.8 | 4.361 | 6 | 18 27 41.11 | 2.2483 | 27 56 37.0 | 2.418 |
| 7 | 16 40 49.69 | 2.2648 | 27 14 42.3 | 4.222 | 7 | 18 29 55.93 | 2.2458 | 27 54 7.8 | 2.554 |
| 8 | 16 43 5.63 | 2.2665 | 27 18 51.4 | 4.082 | 8 | 18 32 10.60 | 2.2432 | 27 51 30.5 | 2.689 |
| 9 | 16 45 21.67 | 2.2682 | 27 22 52.1 | 3.942 | 9 | 18 34 25.11 | 2.2405 | 27 48 45.1 | 2.824 |
| 10 | 16 47 37.81 | 2.2698 | 27 26 44.4 | 3.802 | 10 | 18 36 39.46 | 2.2377 | 27 45 51.6 | 2.959 |
| 11 | 16 49 54.04 | 2.2713 | 27 30 28.3 | 3.662 | 11 | 18 38 53.64 | 2.2348 | 27 42 50.0 | 3.094 |
| 12 | 16 52 10.36 | 2.2727 | 27 34 3.8 | 3.521 | 12 | 18 41 7.64 | 2.2318 | 27 39 40.3 | 3.228 |
| 13 | 16 54 26.76 | 2.2740 | 27 37 30.8 | 3.380 | 13 | 18 43 21.46 | 2.2289 | 27 36 22.6 | 3.361 |
| 14 | 16 56 43.24 | 2.2752 | 27 40 49.4 | 3.239 | 14 | 18 45 35.11 | 2.2260 | 27 32 57.0 | 3.492 |
| 15 | 16 58 59.78 | 2.2763 | 27 43 59.5 | 3.097 | 15 | 18 47 48.58 | 2.2229 | 27 29 23.5 | 3.624 |
| 16 | 17 1 16.39 | 2.2773 | 27 47 1.1 | 2.956 | 16 | 18 50 1.86 | 2.2197 | 27 25 42.1 | 3.757 |
| 17 | 17 3 33.06 | 2.2782 | 27 49 54.2 | 2.814 | 17 | 18 52 14.94 | 2.2164 | 27 21 52.7 | 3.888 |
| 18 | 17 5 49.78 | 2.2791 | 27 52 38.8 | 2.672 | 18 | 18 54 27.82 | 2.2130 | 27 17 55.5 | 4.018 |
| 19 | 17 8 6.55 | 2.2799 | 27 55 14.8 | 2.529 | 19 | 18 56 40.50 | 2.2097 | 27 13 50.5 | 4.147 |
| 20 | 17 10 23.37 | 2.2807 | 27 57 42.3 | 2.387 | 20 | 18 58 52.98 | 2.2062 | 27 9 37.8 | 4.276 |
| 21 | 17 12 40.23 | 2.2813 | 28 0 1.3 | 2.245 | 21 | 19 1 5.24 | 2.2026 | 27 5 17.4 | 4.404 |
| 22 | 17 14 57.12 | 2.2818 | 28 2 11.7 | 2.102 | 22 | 19 3 17.29 | 2.1991 | 27 0 49.3 | 4.532 |
| 23 | 17 17 14.04 | 2.2821 | 28 4 13.5 | 1.959 | 23 | 19 5 29.13 | 2.1955 | 26 56 13.6 | 4.658 |
| 24 | 17 19 30.97 | 2.2823 | S.28 6 6.8 | 1.817 | 24 | 19 7 40.75 | 2.1918 | S.26 51 30.3 | 4.784 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

### SUNDAY 17.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 19 7 40.75 | 2.1918 | S.26 51 30.3 | 4.784 |
| 1 | 19 9 52.14 | 2.1880 | 26 46 39.5 | 4.910 |
| 2 | 19 12 3.31 | 2.1842 | 26 41 41.1 | 5.035 |
| 3 | 19 14 14.25 | 2.1804 | 26 36 35.3 | 5.159 |
| 4 | 19 16 24.96 | 2.1765 | 26 31 22.1 | 5.282 |
| 5 | 19 18 35.43 | 2.1726 | 26 26 1.5 | 5.404 |
| 6 | 19 20 45.67 | 2.1687 | 26 20 33.6 | 5.526 |
| 7 | 19 22 55.67 | 2.1646 | 26 14 58.4 | 5.647 |
| 8 | 19 25 5.42 | 2.1604 | 26 9 15.9 | 5.768 |
| 9 | 19 27 14.92 | 2.1563 | 26 3 26.2 | 5.888 |
| 10 | 19 29 24.18 | 2.1522 | 25 57 29.4 | 6.006 |
| 11 | 19 31 33.19 | 2.1480 | 25 51 25.5 | 6.123 |
| 12 | 19 33 41.94 | 2.1437 | 25 45 14.6 | 6.240 |
| 13 | 19 35 50.44 | 2.1395 | 25 38 56.7 | 6.357 |
| 14 | 19 37 58.68 | 2.1352 | 25 32 31.8 | 6.473 |
| 15 | 19 40 6.67 | 2.1310 | 25 25 59.9 | 6.588 |
| 16 | 19 42 14.40 | 2.1267 | 25 19 21.2 | 6.702 |
| 17 | 19 44 21.87 | 2.1223 | 25 12 35.7 | 6.814 |
| 18 | 19 46 29.07 | 2.1178 | 25 5 43.5 | 6.926 |
| 19 | 19 48 36.01 | 2.1134 | 24 58 44.6 | 7.038 |
| 20 | 19 50 42.68 | 2.1089 | 24 51 39.0 | 7.149 |
| 21 | 19 52 49.08 | 2.1045 | 24 44 26.7 | 7.259 |
| 22 | 19 54 55.22 | 2.1001 | 24 37 7.9 | 7.368 |
| 23 | 19 57 1.09 | 2.0956 | S.24 29 42.6 | 7.476 |

### MONDAY 18.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 19 59 6.69 | 2.0911 | S.24 22 10.8 | 7.583 |
| 1 | 20 1 12.02 | 2.0866 | 24 14 32.6 | 7.690 |
| 2 | 20 3 17.08 | 2.0821 | 24 6 48.0 | 7.795 |
| 3 | 20 5 21.87 | 2.0775 | 23 58 57.2 | 7.899 |
| 4 | 20 7 26.38 | 2.0729 | 23 51 0.1 | 8.003 |
| 5 | 20 9 30.62 | 2.0684 | 23 42 56.8 | 8.106 |
| 6 | 20 11 34.59 | 2.0639 | 23 34 47.4 | 8.207 |
| 7 | 20 13 38.29 | 2.0593 | 23 26 31.9 | 8.308 |
| 8 | 20 15 41.71 | 2.0547 | 23 18 10.4 | 8.409 |
| 9 | 20 17 44.86 | 2.0502 | 23 9 42.8 | 8.510 |
| 10 | 20 19 47.74 | 2.0457 | 23 1 9.2 | 8.609 |
| 11 | 20 21 50.35 | 2.0412 | 22 52 29.7 | 8.707 |
| 12 | 20 23 52.68 | 2.0366 | 22 43 44.4 | 8.803 |
| 13 | 20 25 54.74 | 2.0321 | 22 34 53.3 | 8.899 |
| 14 | 20 27 56.53 | 2.0276 | 22 25 56.5 | 8.994 |
| 15 | 20 29 58.05 | 2.0231 | 22 16 54.0 | 9.088 |
| 16 | 20 31 59.30 | 2.0186 | 22 7 45.9 | 9.182 |
| 17 | 20 34 0.28 | 2.0142 | 21 58 32.2 | 9.274 |
| 18 | 20 36 1.00 | 2.0097 | 21 49 13.0 | 9.366 |
| 19 | 20 38 1.45 | 2.0052 | 21 39 48.3 | 9.457 |
| 20 | 20 40 1.63 | 2.0008 | 21 30 18.2 | 9.547 |
| 21 | 20 42 1.55 | 1.9964 | 21 20 42.7 | 9.636 |
| 22 | 20 44 1.20 | 1.9919 | 21 11 1.9 | 9.724 |
| 23 | 20 46 0.58 | 1.9875 | 21 1 15.8 | 9.812 |
| 24 | 20 47 59.70 | 1.9832 | S.20 51 24.5 | 9.898 |

### TUESDAY 19.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 20 47 59.70 | 1.9832 | S.20 51 24.5 | 9.898 |
| 1 | 20 49 58.57 | 1.9790 | 20 41 28.0 | 9.984 |
| 2 | 20 51 57.18 | 1.9747 | 20 31 26.4 | 10.069 |
| 3 | 20 53 55.53 | 1.9704 | 20 21 19.7 | 10.153 |
| 4 | 20 55 53.63 | 1.9662 | 20 11 8.0 | 10.236 |
| 5 | 20 57 51.47 | 1.9619 | 20 0 51.4 | 10.318 |
| 6 | 20 59 49.06 | 1.9577 | 19 50 29.9 | 10.399 |
| 7 | 21 1 46.40 | 1.9536 | 19 40 3.5 | 10.480 |
| 8 | 21 3 43.49 | 1.9495 | 19 29 32.3 | 10.560 |
| 9 | 21 5 40.34 | 1.9455 | 19 18 56.3 | 10.639 |
| 10 | 21 7 36.95 | 1.9415 | 19 8 15.6 | 10.717 |
| 11 | 21 9 33.32 | 1.9375 | 18 57 30.2 | 10.795 |
| 12 | 21 11 29.45 | 1.9335 | 18 46 40.2 | 10.872 |
| 13 | 21 13 25.34 | 1.9295 | 18 35 45.6 | 10.948 |
| 14 | 21 15 20.99 | 1.9257 | 18 24 46.5 | 11.022 |
| 15 | 21 17 16.42 | 1.9219 | 18 13 43.0 | 11.095 |
| 16 | 21 19 11.62 | 1.9181 | 18 2 35.1 | 11.169 |
| 17 | 21 21 6.59 | 1.9143 | 17 51 22.7 | 11.242 |
| 18 | 21 23 1.33 | 1.9105 | 17 40 6.0 | 11.314 |
| 19 | 21 24 55.85 | 1.9068 | 17 28 45.0 | 11.385 |
| 20 | 21 26 50.15 | 1.9032 | 17 17 19.8 | 11.454 |
| 21 | 21 28 44.24 | 1.8997 | 17 5 50.5 | 11.523 |
| 22 | 21 30 38.12 | 1.8962 | 16 54 17.0 | 11.592 |
| 23 | 21 32 31.79 | 1.8927 | S.16 42 39.4 | 11.660 |

### WEDNESDAY 20.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 21 34 25.25 | 1.8892 | S.16 30 57.8 | 11.727 |
| 1 | 21 36 18.50 | 1.8858 | 16 19 12.2 | 11.793 |
| 2 | 21 38 11.55 | 1.8825 | 16 7 22.6 | 11.859 |
| 3 | 21 40 4.40 | 1.8793 | 15 55 29.1 | 11.924 |
| 4 | 21 41 57.06 | 1.8761 | 15 43 31.7 | 11.988 |
| 5 | 21 43 49.53 | 1.8729 | 15 31 30.5 | 12.051 |
| 6 | 21 45 41.81 | 1.8697 | 15 19 25.6 | 12.113 |
| 7 | 21 47 33.90 | 1.8666 | 15 7 17.0 | 12.174 |
| 8 | 21 49 25.80 | 1.8636 | 14 55 4.7 | 12.235 |
| 9 | 21 51 17.53 | 1.8607 | 14 42 48.8 | 12.295 |
| 10 | 21 53 9.09 | 1.8579 | 14 30 29.3 | 12.355 |
| 11 | 21 55 0.48 | 1.8551 | 14 18 6.2 | 12.414 |
| 12 | 21 56 51.70 | 1.8523 | 14 5 39.6 | 12.472 |
| 13 | 21 58 42.75 | 1.8495 | 13 53 9.6 | 12.528 |
| 14 | 22 0 33.64 | 1.8468 | 13 40 36.2 | 12.584 |
| 15 | 22 2 24.37 | 1.8442 | 13 27 59.5 | 12.640 |
| 16 | 22 4 14.95 | 1.8417 | 13 15 19.4 | 12.696 |
| 17 | 22 6 5.38 | 1.8392 | 13 2 36.0 | 12.751 |
| 18 | 22 7 55.66 | 1.8368 | 12 49 49.3 | 12.805 |
| 19 | 22 9 45.80 | 1.8346 | 12 36 59.4 | 12.857 |
| 20 | 22 11 35.81 | 1.8323 | 12 24 6.4 | 12.909 |
| 21 | 22 13 25.68 | 1.8300 | 12 11 10.3 | 12.960 |
| 22 | 22 15 15.41 | 1.8278 | 11 58 11.2 | 13.011 |
| 23 | 22 17 5.01 | 1.8257 | 11 45 9.0 | 13.062 |
| 24 | 22 18 54.49 | 1.8237 | S.11 32 3.8 | 13.111 |

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | **THURSDAY 21.** | | | |
| | h m s | s | ° ′ ″ | ″ |
| 0 | 22 18 54.49 | 1.8237 | S. 11 32 3.8 | 13.111 |
| 1 | 22 20 43.85 | 1.8217 | 11 18 55.7 | 13.159 |
| 2 | 22 22 33.09 | 1.8198 | 11 5 44.7 | 13.207 |
| 3 | 22 24 22.22 | 1.8180 | 10 52 30.9 | 13.254 |
| 4 | 22 26 11.25 | 1.8163 | 10 39 14.2 | 13.301 |
| 5 | 22 28 0.18 | 1.8147 | 10 25 54.7 | 13.347 |
| 6 | 22 29 49.01 | 1.8130 | 10 12 32.5 | 13.392 |
| 7 | 22 31 37.74 | 1.8114 | 9 59 7.7 | 13.436 |
| 8 | 22 33 26.38 | 1.8099 | 9 45 40.2 | 13.480 |
| 9 | 22 35 14.93 | 1.8085 | 9 32 10.1 | 13.523 |
| 10 | 22 37 3.40 | 1.8072 | 9 18 37.4 | 13.566 |
| 11 | 22 38 51.79 | 1.8059 | 9 5 2.2 | 13.607 |
| 12 | 22 40 40.11 | 1.8047 | 8 51 24.6 | 13.648 |
| 13 | 22 42 28.36 | 1.8036 | 8 37 44.5 | 13.688 |
| 14 | 22 44 16.54 | 1.8025 | 8 24 2.0 | 13.728 |
| 15 | 22 46 4.66 | 1.8015 | 8 10 17.1 | 13.767 |
| 16 | 22 47 52.72 | 1.8006 | 7 56 29.9 | 13.806 |
| 17 | 22 49 40.73 | 1.7998 | 7 42 40.4 | 13.844 |
| 18 | 22 51 28.70 | 1.7992 | 7 28 48.6 | 13.882 |
| 19 | 22 53 16.63 | 1.7985 | 7 14 54.6 | 13.918 |
| 20 | 22 55 4.52 | 1.7978 | 7 0 58.5 | 13.953 |
| 21 | 22 56 52.37 | 1.7972 | 6 47 0.3 | 13.988 |
| 22 | 22 58 40.19 | 1.7968 | 6 33 0.0 | 14.023 |
| 23 | 23 0 27.99 | 1.7964 | S. 6 18 57.6 | 14.057 |
| | **FRIDAY 22.** | | | |
| 0 | 23 2 15.76 | 1.7961 | S. 6 4 53.2 | 14.089 |
| 1 | 23 4 3.52 | 1.7958 | 5 50 46.9 | 14.121 |
| 2 | 23 5 51.27 | 1.7957 | 5 36 38.7 | 14.152 |
| 3 | 23 7 39.01 | 1.7957 | 5 22 28.6 | 14.184 |
| 4 | 23 9 26.75 | 1.7957 | 5 8 16.6 | 14.215 |
| 5 | 23 11 14.50 | 1.7959 | 4 54 2.8 | 14.244 |
| 6 | 23 13 2.26 | 1.7961 | 4 39 47.3 | 14.273 |
| 7 | 23 14 50.03 | 1.7963 | 4 25 30.1 | 14.301 |
| 8 | 23 16 37.81 | 1.7965 | 4 11 11.2 | 14.329 |
| 9 | 23 18 25.61 | 1.7969 | 3 56 50.6 | 14.356 |
| 10 | 23 20 13.44 | 1.7975 | 3 42 28.5 | 14.382 |
| 11 | 23 22 1.31 | 1.7981 | 3 28 4.8 | 14.408 |
| 12 | 23 23 49.21 | 1.7987 | 3 13 39.6 | 14.433 |
| 13 | 23 25 37.15 | 1.7994 | 2 59 12.9 | 14.457 |
| 14 | 23 27 25.14 | 1.8003 | 2 44 44.8 | 14.479 |
| 15 | 23 29 13.19 | 1.8012 | 2 30 15.4 | 14.502 |
| 16 | 23 31 1.29 | 1.8022 | 2 15 44.6 | 14.524 |
| 17 | 23 32 49.45 | 1.8032 | 2 1 12.5 | 14.545 |
| 18 | 23 34 37.68 | 1.8044 | 1 46 39.2 | 14.566 |
| 19 | 23 36 25.98 | 1.8057 | 1 32 4.6 | 14.587 |
| 20 | 23 38 14.36 | 1.8070 | 1 17 28.8 | 14.606 |
| 21 | 23 40 2.82 | 1.8084 | 1 2 51.9 | 14.624 |
| 22 | 23 41 51.37 | 1.8099 | 0 48 14.0 | 14.641 |
| 23 | 23 43 40.01 | 1.8114 | 0 33 35.0 | 14.658 |
| 24 | 23 45 28.74 | 1.8131 | S. 0 18 55.0 | 14.675 |

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | **SATURDAY 23.** | | | |
| | h m s | s | ° ′ ″ | ″ |
| 0 | 23 45 28.74 | 1.8131 | S. 0 18 55.0 | 14.675 |
| 1 | 23 47 17.58 | 1.8149 | S. 0 4 14.0 | 14.691 |
| 2 | 23 49 6.53 | 1.8168 | N. 0 10 27.9 | 14.705 |
| 3 | 23 50 55.59 | 1.8187 | 0 25 10.6 | 14.718 |
| 4 | 23 52 44.77 | 1.8207 | 0 39 54.1 | 14.731 |
| 5 | 23 54 34.08 | 1.8228 | 0 54 38.3 | 14.743 |
| 6 | 23 56 23.51 | 1.8249 | 1 9 23.2 | 14.754 |
| 7 | 23 58 13.07 | 1.8272 | 1 24 8.8 | 14.765 |
| 8 | 0 0 2.77 | 1.8296 | 1 38 55.0 | 14.775 |
| 9 | 0 1 52.62 | 1.8321 | 1 53 41.8 | 14.785 |
| 10 | 0 3 42.62 | 1.8347 | 2 8 29.2 | 14.794 |
| 11 | 0 5 32.78 | 1.8373 | 2 23 17.1 | 14.802 |
| 12 | 0 7 23.10 | 1.8401 | 2 38 5.4 | 14.808 |
| 13 | 0 9 13.59 | 1.8429 | 2 52 54.1 | 14.814 |
| 14 | 0 11 4.25 | 1.8457 | 3 7 43.1 | 14.818 |
| 15 | 0 12 55.08 | 1.8487 | 3 22 32.3 | 14.823 |
| 16 | 0 14 46.10 | 1.8519 | 3 37 21.8 | 14.827 |
| 17 | 0 16 37.31 | 1.8551 | 3 52 11.5 | 14.829 |
| 18 | 0 18 28.71 | 1.8583 | 4 7 1.3 | 14.831 |
| 19 | 0 20 20.31 | 1.8617 | 4 21 51.2 | 14.832 |
| 20 | 0 22 12.12 | 1.8652 | 4 36 41.1 | 14.831 |
| 21 | 0 24 4.14 | 1.8688 | 4 51 30.9 | 14.829 |
| 22 | 0 25 56.38 | 1.8725 | 5 6 20.6 | 14.827 |
| 23 | 0 27 48.84 | 1.8763 | N. 5 21 10.2 | 14.825 |
| | **SUNDAY 24.** | | | |
| 0 | 0 29 41.53 | 1.8801 | N. 5 35 59.6 | 14.821 |
| 1 | 0 31 34.45 | 1.8840 | 5 50 48.7 | 14.816 |
| 2 | 0 33 27.61 | 1.8881 | 6 5 37.5 | 14.811 |
| 3 | 0 35 21.02 | 1.8922 | 6 20 26.0 | 14.804 |
| 4 | 0 37 14.68 | 1.8964 | 6 35 14.0 | 14.796 |
| 5 | 0 39 8.59 | 1.9007 | 6 50 1.5 | 14.787 |
| 6 | 0 41 2.77 | 1.9052 | 7 4 48.5 | 14.778 |
| 7 | 0 42 57.22 | 1.9097 | 7 19 34.9 | 14.767 |
| 8 | 0 44 51.94 | 1.9143 | 7 34 20.6 | 14.755 |
| 9 | 0 46 46.94 | 1.9190 | 7 49 5.5 | 14.742 |
| 10 | 0 48 42.22 | 1.9238 | 8 3 49.6 | 14.728 |
| 11 | 0 50 37.79 | 1.9287 | 8 18 32.9 | 14.714 |
| 12 | 0 52 33.66 | 1.9337 | 8 33 15.3 | 14.698 |
| 13 | 0 54 29.83 | 1.9388 | 8 47 56.7 | 14.681 |
| 14 | 0 56 26.31 | 1.9440 | 9 2 37.0 | 14.662 |
| 15 | 0 58 23.11 | 1.9493 | 9 17 16.1 | 14.642 |
| 16 | 1 0 20.23 | 1.9547 | 9 31 54.0 | 14.622 |
| 17 | 1 2 17.68 | 1.9602 | 9 46 30.7 | 14.600 |
| 18 | 1 4 15.46 | 1.9657 | 10 1 6.0 | 14.577 |
| 19 | 1 6 13.57 | 1.9713 | 10 15 39.9 | 14.553 |
| 20 | 1 8 12.02 | 1.9772 | 10 30 12.3 | 14.528 |
| 21 | 1 10 10.83 | 1.9832 | 10 44 43.2 | 14.501 |
| 22 | 1 12 10.00 | 1.9892 | 10 59 12.4 | 14.472 |
| 23 | 1 14 9.53 | 1.9952 | 11 13 39.9 | 14.443 |
| 24 | 1 16 9.42 | 2.0013 | N. 11 28 5.6 | 14.413 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. | Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|---|---|---|---|---|
| | MONDAY 25. | | | | | WEDNESDAY 27. | | | |
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| 0 | 1 16 9.42 | 2.0013 | N.11 28 5.6 | 14.413 | 0 | 3 1 0.86 | 2.3966 | N.21 56 13.1 | 11.088 |
| 1 | 1 18 9.68 | 2.0075 | 11 42 29.5 | 14.382 | 1 | 3 3 24.95 | 2.4063 | 22 7 15.0 | 10.972 |
| 2 | 1 20 10.32 | 2.0139 | 11 56 51.4 | 14.348 | 2 | 3 5 49.62 | 2.4160 | 22 18 9.8 | 10.854 |
| 3 | 1 22 11.35 | 2.0204 | 12 11 11.3 | 14.314 | 3 | 3 8 14.87 | 2.4257 | 22 28 57.5 | 10.734 |
| 4 | 1 24 12.77 | 2.0269 | 12 25 29.1 | 14.278 | 4 | 3 10 40.71 | 2.4355 | 22 39 37.9 | 10.612 |
| 5 | 1 26 14.58 | 2.0335 | 12 39 44.7 | 14.242 | 5 | 3 13 7.13 | 2.4452 | 22 50 10.9 | 10.488 |
| 6 | 1 28 16.79 | 2.0402 | 12 53 58.1 | 14.203 | 6 | 3 15 34.14 | 2.4550 | 23 0 36.4 | 10.362 |
| 7 | 1 30 19.41 | 2.0471 | 13 8 9.1 | 14.163 | 7 | 3 18 1.73 | 2.4647 | 23 10 54.3 | 10.233 |
| 8 | 1 32 22.44 | 2.0540 | 13 22 17.7 | 14.122 | 8 | 3 20 29.91 | 2.4745 | 23 21 4.3 | 10.101 |
| 9 | 1 34 25.89 | 2.0611 | 13 36 23.8 | 14.079 | 9 | 3 22 58.67 | 2.4842 | 23 31 6.4 | 9.968 |
| 10 | 1 36 29.77 | 2.0682 | 13 50 27.2 | 14.035 | 10 | 3 25 28.01 | 2.4939 | 23 41 0.5 | 9.833 |
| 11 | 1 38 34.08 | 2.0754 | 14 4 28.0 | 13.990 | 11 | 3 27 57.93 | 2.5036 | 23 50 46.4 | 9.695 |
| 12 | 1 40 38.82 | 2.0827 | 14 18 26.0 | 13.942 | 12 | 3 30 28.44 | 2.5133 | 24 0 23.9 | 9.555 |
| 13 | 1 42 44.00 | 2.0901 | 14 32 21.1 | 13.894 | 13 | 3 32 59.53 | 2.5229 | 24 9 53.0 | 9.413 |
| 14 | 1 44 49.63 | 2.0976 | 14 46 13.3 | 13.844 | 14 | 3 35 31.19 | 2.5325 | 24 19 13.5 | 9.269 |
| 15 | 1 46 55.71 | 2.1051 | 15 0 2.4 | 13.792 | 15 | 3 38 3.43 | 2.5421 | 24 28 25.3 | 9.122 |
| 16 | 1 49 2.24 | 2.1128 | 15 13 48.4 | 13.739 | 16 | 3 40 36.24 | 2.5516 | 24 37 28.2 | 8.974 |
| 17 | 1 51 9.24 | 2.1206 | 15 27 31.1 | 13.683 | 17 | 3 43 9.62 | 2.5611 | 24 46 22.2 | 8.824 |
| 18 | 1 53 16.71 | 2.1284 | 15 41 10.4 | 13.627 | 18 | 3 45 43.57 | 2.5706 | 24 55 7.1 | 8.671 |
| 19 | 1 55 24.65 | 2.1363 | 15 54 46.3 | 13.569 | 19 | 3 48 18.09 | 2.5800 | 25 3 42.7 | 8.515 |
| 20 | 1 57 33.06 | 2.1443 | 16 8 18.7 | 13.509 | 20 | 3 50 53.17 | 2.5893 | 25 12 8.9 | 8.357 |
| 21 | 1 59 41.96 | 2.1524 | 16 21 47.4 | 13.448 | 21 | 3 53 28.80 | 2.5985 | 25 20 25.6 | 8.197 |
| 22 | 2 1 51.35 | 2.1606 | 16 35 12.4 | 13.385 | 22 | 3 56 4.99 | 2.6077 | 25 28 32.6 | 8.035 |
| 23 | 2 4 1.23 | 2.1688 | N.16 48 33.6 | 13.320 | 23 | 3 58 41.73 | 2.6168 | N.25 36 29.8 | 7.872 |
| | TUESDAY 26. | | | | | THURSDAY 28. | | | |
| 0 | 2 6 11.61 | 2.1772 | N.17 1 50.8 | 13.253 | 0 | 4 1 19.01 | 2.6258 | N.25 44 17.2 | 7.706 |
| 1 | 2 8 22.50 | 2.1857 | 17 15 4.0 | 13.185 | 1 | 4 3 56.82 | 2.6347 | 25 51 54.5 | 7.538 |
| 2 | 2 10 33.89 | 2.1941 | 17 28 13.0 | 13.115 | 2 | 4 6 35.17 | 2.6436 | 25 59 21.7 | 7.368 |
| 3 | 2 12 45.79 | 2.2026 | 17 41 17.8 | 13.043 | 3 | 4 9 14.05 | 2.6523 | 26 6 38.6 | 7.195 |
| 4 | 2 14 58.20 | 2.2112 | 17 54 18.2 | 12.969 | 4 | 4 11 53.45 | 2.6609 | 26 13 45.1 | 7.020 |
| 5 | 2 17 11.13 | 2.2199 | 18 7 14.1 | 12.893 | 5 | 4 14 33.36 | 2.6694 | 26 20 41.0 | 6.843 |
| 6 | 2 19 24.59 | 2.2287 | 18 20 5.4 | 12.817 | 6 | 4 17 13.78 | 2.6778 | 26 27 26.3 | 6.665 |
| 7 | 2 21 38.58 | 2.2376 | 18 32 52.1 | 12.738 | 7 | 4 19 54.70 | 2.6861 | 26 34 0.8 | 6.484 |
| 8 | 2 23 53.10 | 2.2465 | 18 45 33.9 | 12.656 | 8 | 4 22 36.11 | 2.6942 | 26 40 24.4 | 6.302 |
| 9 | 2 26 8.16 | 2.2555 | 18 58 10.8 | 12.573 | 9 | 4 25 18.01 | 2.7023 | 26 46 37.0 | 6.117 |
| 10 | 2 28 23.76 | 2.2646 | 19 10 42.7 | 12.488 | 10 | 4 28 0.39 | 2.7102 | 26 52 38.4 | 5.930 |
| 11 | 2 30 39.91 | 2.2737 | 19 23 9.4 | 12.401 | 11 | 4 30 43.23 | 2.7178 | 26 58 28.6 | 5.742 |
| 12 | 2 32 56.61 | 2.2829 | 19 35 30.8 | 12.313 | 12 | 4 33 26.53 | 2.7254 | 27 4 7.4 | 5.551 |
| 13 | 2 35 13.86 | 2.2922 | 19 47 46.9 | 12.222 | 13 | 4 36 10.28 | 2.7329 | 27 9 34.7 | 5.358 |
| 14 | 2 37 31.67 | 2.3014 | 19 59 57.4 | 12.128 | 14 | 4 38 54.48 | 2.7402 | 27 14 50.4 | 5.165 |
| 15 | 2 39 50.03 | 2.3107 | 20 12 2.3 | 12.034 | 15 | 4 41 39.11 | 2.7473 | 27 19 54.5 | 4.970 |
| 16 | 2 42 8.95 | 2.3201 | 20 24 1.5 | 11.937 | 16 | 4 44 24.16 | 2.7543 | 27 24 46.8 | 4.772 |
| 17 | 2 44 28.44 | 2.3295 | 20 35 54.8 | 11.838 | 17 | 4 47 9.62 | 2.7611 | 27 29 27.2 | 4.572 |
| 18 | 2 46 48.49 | 2.3389 | 20 47 42.1 | 11.737 | 18 | 4 49 55.49 | 2.7677 | 27 33 55.5 | 4.371 |
| 19 | 2 49 9.11 | 2.3485 | 20 59 23.3 | 11.634 | 19 | 4 52 41.75 | 2.7741 | 27 38 11.7 | 4.169 |
| 20 | 2 51 30.31 | 2.3582 | 21 10 58.2 | 11.529 | 20 | 4 55 28.38 | 2.7803 | 27 42 15.8 | 3.965 |
| 21 | 2 53 52.09 | 2.3678 | 21 22 26.8 | 11.422 | 21 | 4 58 15.38 | 2.7863 | 27 46 7.6 | 3.760 |
| 22 | 2 56 14.44 | 2.3773 | 21 33 48.9 | 11.313 | 22 | 5 1 2.74 | 2.7922 | 27 49 47.0 | 3.553 |
| 23 | 2 58 37.36 | 2.3869 | 21 45 4.4 | 11.202 | 23 | 5 3 50.44 | 2.7976 | 27 53 14.0 | 3.345 |
| 24 | 3 1 0.86 | 2.3966 | N.21 56 13.1 | 11.088 | 24 | 5 6 38.48 | 2.8033 | N.27 56 28.4 | 3.135 |

## GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION

#### FRIDAY 29.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 5 6 38.48 | 2.8033 | N.27 56 28.4 | 3.135 |
| 1 | 5 9 26.84 | 2.8085 | 27 59 30.2 | 2.924 |
| 2 | 5 12 15.50 | 2.8134 | 28 2 19.3 | 2.712 |
| 3 | 5 15 4.45 | 2.8182 | 28 4 55.6 | 2.498 |
| 4 | 5 17 53.68 | 2.8228 | 28 7 19.1 | 2.284 |
| 5 | 5 20 43.18 | 2.8272 | 28 9 29.7 | 2.068 |
| 6 | 5 23 32.94 | 2.8313 | 28 11 27.3 | 1.852 |
| 7 | 5 26 22.94 | 2.8352 | 28 13 11.9 | 1.634 |
| 8 | 5 29 13.16 | 2.8388 | 28 14 43.4 | 1.415 |
| 9 | 5 32 3.59 | 2.8422 | 28 16 1.7 | 1.195 |
| 10 | 5 34 54.22 | 2.8453 | 28 17 6.8 | 0.975 |
| 11 | 5 37 45.03 | 2.8482 | 28 17 58.7 | 0.753 |
| 12 | 5 40 36.00 | 2.8508 | 28 18 37.2 | 0.531 |
| 13 | 5 43 27.12 | 2.8532 | 28 19 2.4 | 0.309 |
| 14 | 5 46 18.38 | 2.8554 | 28 19 14.3 | +0.087 |
| 15 | 5 49 9.77 | 2.8574 | 28 19 12.8 | −0.137 |
| 16 | 5 52 1.27 | 2.8591 | 28 18 57.9 | 0.361 |
| 17 | 5 54 52.86 | 2.8604 | 28 18 29.5 | 0.585 |
| 18 | 5 57 44.52 | 2.8615 | 28 17 47.7 | 0.809 |
| 19 | 6 0 36.24 | 2.8624 | 28 16 52.4 | 1.034 |
| 20 | 6 3 28.01 | 2.8631 | 28 15 43.6 | 1.259 |
| 21 | 6 6 19.81 | 2.8635 | 28 14 21.3 | 1.484 |
| 22 | 6 9 11.63 | 2.8637 | 28 12 45.5 | 1.709 |
| 23 | 6 12 3.45 | 2.8635 | N.28 10 56.2 | 1.933 |

#### SATURDAY 30.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 6 14 55.25 | 2.8631 | N.28 8 53.5 | 2.158 |
| 1 | 6 17 47.02 | 2.8625 | 28 6 37.3 | 2.383 |
| 2 | 6 20 38.75 | 2.8617 | 28 4 7.6 | 2.608 |
| 3 | 6 23 30.42 | 2.8605 | 28 1 24.4 | 2.832 |
| 4 | 6 26 22.01 | 2.8591 | 27 58 27.8 | 3.055 |
| 5 | 6 29 13.51 | 2.8574 | 27 55 17.8 | 3.278 |
| 6 | 6 32 4.90 | 2.8555 | 27 51 54.4 | 3.501 |
| 7 | 6 34 56.17 | 2.8534 | 27 48 17.7 | 3.723 |
| 8 | 6 37 47.31 | 2.8511 | 27 44 27.7 | 3.944 |
| 9 | 6 40 38.30 | 2.8484 | 27 40 24.4 | 4.165 |
| 10 | 6 43 29.12 | 2.8455 | 27 36 7.9 | 4.384 |
| 11 | 6 46 19.76 | 2.8425 | 22 31 38.3 | 4.603 |
| 12 | 6 49 10.22 | 2.8392 | 27 26 55.6 | 4.821 |
| 13 | 6 52 0.47 | 2.8357 | 27 21 59.8 | 5.038 |
| 14 | 6 54 50.50 | 2.8318 | 27 16 51.0 | 5.254 |
| 15 | 6 57 40.29 | 2.8278 | 27 11 29.3 | 5.468 |
| 16 | 7 0 29.84 | 2.8237 | 27 5 54.8 | 5.682 |
| 17 | 7 3 19.14 | 2.8194 | 27 0 7.5 | 5.894 |
| 18 | 7 6 8.17 | 2.8148 | 26 54 7.5 | 6.106 |
| 19 | 7 8 56.92 | 2.8100 | 26 47 54.8 | 6.316 |
| 20 | 7 11 45.37 | 2.8049 | 26 41 29.6 | 6.523 |
| 21 | 7 14 33.51 | 2.7997 | 26 34 52.0 | 6.730 |
| 22 | 7 17 21.33 | 2.7943 | 26 28 2.0 | 6.936 |
| 23 | 7 20 8.83 | 2.7888 | 26 20 59.7 | 7.140 |
| 24 | 7 22 55.99 | 2.7831 | N.26 13 45.2 | 7.342 |

#### SUNDAY 31.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ |
| 0 | 7 22 55.99 | 2.7831 | N.26 13 45.2 | 7.342 |
| 1 | 7 25 42.80 | 2.7772 | 26 6 18.6 | 7.543 |
| 2 | 7 28 29.25 | 2.7710 | 25 58 40.0 | 7.742 |
| 3 | 7 31 15.32 | 2.7647 | 25 50 49.6 | 7.938 |
| 4 | 7 34 1.01 | 2.7583 | 25 42 47.4 | 8.134 |
| 5 | 7 36 46.31 | 2.7518 | 25 34 33.5 | 8.327 |
| 6 | 7 39 31.22 | 2.7451 | 25 26 8.1 | 8.519 |
| 7 | 7 42 15.72 | 2.7382 | 25 17 31.2 | 8.709 |
| 8 | 7 44 59.80 | 2.7311 | 25 8 43.0 | 8.897 |
| 9 | 7 47 43.45 | 2.7239 | 24 59 43.6 | 9.083 |
| 10 | 7 50 26.67 | 2.7167 | 24 50 33.1 | 9.267 |
| 11 | 7 53 9.45 | 2.7093 | 24 41 11.6 | 9.448 |
| 12 | 7 55 51.78 | 2.7018 | 24 31 39.3 | 9.627 |
| 13 | 7 58 33.66 | 2.6942 | 24 21 56.3 | 9.805 |
| 14 | 8 1 15.08 | 2.6865 | 24 12 2.7 | 9.980 |
| 15 | 8 3 56.04 | 2.6787 | 24 1 58.7 | 10.153 |
| 16 | 8 6 36.53 | 2.6708 | 23 51 44.4 | 10.324 |
| 17 | 8 9 16.54 | 2.6628 | 23 41 19.8 | 10.494 |
| 18 | 8 11 56.06 | 2.6547 | 23 30 45.1 | 10.661 |
| 19 | 8 14 35.10 | 2.6466 | 23 20 0.5 | 10.824 |
| 20 | 8 17 13.65 | 2.6384 | 23 9 6.2 | 10.986 |
| 21 | 8 19 51.71 | 2.6302 | 22 58 2.2 | 11.146 |
| 22 | 8 22 29.27 | 2.6218 | 22 46 48.7 | 11.303 |
| 23 | 8 25 6.32 | 2.6133 | N.22 35 25.9 | 11.458 |

#### MONDAY, JANUARY 1, 1877.

| Hour. | Right Ascension. | Diff. for 1 m. | Declination. | Diff. for 1 m. |
|---|---|---|---|---|
| 0 | 8 27 42.86 | 2.6048 | N.22 23 53.8 | 11.611 |

### PHASES OF THE MOON.

| | d | h | m |
|---|---|---|---|
| ☾ Last Quarter, . . | 7 | 14 | 23.5 |
| ● New Moon, . . | 15 | 6 | 13.9 |
| ☽ First Quarter, . . | 23 | 11 | 41.4 |
| ○ Full Moon, . . . | 30 | 9 | 59.1 |

| | d | h |
|---|---|---|
| ☾ Perigee, . . . . . | 2 | 15.9 |
| ☾ Apogee, . . . . . | 18 | 9.5 |

## GREENWICH MEAN TIME.

### LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Fomalhaut | W. | 99° 20′ 44″ | 2378 | 101° 4′ 50″ | 2374 | 102° 49′ 2″ | 2372 | 104° 33′ 17″ | 2371 |
| | Saturn | W. | 98 20 23 | 2116 | 100 10 57 | 2109 | 102 1 42 | 2103 | 103 52 37 | 2096 |
| | α Pegasi | W. | 77 29 5 | 2353 | 79 13 48 | 2342 | 80 58 47 | 2333 | 82 43 59 | 2324 |
| | α Arietis | W. | 34 20 40 | 2178 | 36 9 41 | 2165 | 37 59 2 | 2152 | 39 48 42 | 2141 |
| | Pollux | E. | 41 5 38 | 2114 | 39 15 0 | 2107 | 37 24 12 | 2101 | 35 33 15 | 2096 |
| | Regulus | E. | 77 53 14 | 2103 | 76 2 20 | 2096 | 74 11 15 | 2090 | 72 20 0 | 2083 |
| 2 | α Pegasi | W. | 91 32 26 | 2300 | 93 18 25 | 2299 | 95 4 26 | 2299 | 96 50 27 | 2300 |
| | α Arietis | W. | 49 0 35 | 2104 | 50 51 28 | 2099 | 52 42 28 | 2096 | 54 33 33 | 2094 |
| | Regulus | E. | 63 1 42 | 2062 | 61 9 45 | 2061 | 59 17 45 | 2059 | 57 25 43 | 2059 |
| 3 | α Arietis | W. | 63 49 29 | 2093 | 65 40 39 | 2096 | 67 31 45 | 2098 | 69 22 47 | 2102 |
| | Aldebaran | W. | 33 33 30 | 2299 | 35 19 31 | 2281 | 37 5 59 | 2266 | 38 52 48 | 2256 |
| | Regulus | E. | 48 5 36 | 2064 | 46 13 42 | 2068 | 44 21 53 | 2072 | 42 30 10 | 2076 |
| | Spica | E. | 102 5 55 | 2063 | 100 13 59 | 2067 | 98 22 9 | 2071 | 96 30 25 | 2075 |
| | Mars | E. | 112 16 37 | 2271 | 110 29 55 | 2274 | 108 43 18 | 2278 | 106 56 46 | 2283 |
| | Venus | E. | 114 39 35 | 2460 | 112 57 26 | 2462 | 111 15 20 | 2466 | 109 33 19 | 2471 |
| 4 | α Arietis | W. | 78 36 14 | 2130 | 80 26 28 | 2136 | 82 16 32 | 2144 | 84 6 24 | 2153 |
| | Aldebaran | W. | 47 49 41 | 2235 | 49 37 17 | 2235 | 51 24 53 | 2237 | 53 12 26 | 2240 |
| | Regulus | E. | 33 13 34 | 2107 | 31 22 45 | 2114 | 29 32 7 | 2122 | 27 41 42 | 2132 |
| | Spica | E. | 87 13 39 | 2105 | 85 22 47 | 2112 | 83 32 6 | 2120 | 81 41 38 | 2128 |
| | Mars | E. | 98 5 58 | 2313 | 96 20 18 | 2321 | 94 34 49 | 2329 | 92 49 32 | 2337 |
| | Venus | E. | 101 5 7 | 2502 | 99 23 57 | 2510 | 97 42 58 | 2520 | 96 2 12 | 2528 |
| | Sun | E. | 137 33 48 | 2449 | 135 51 23 | 2455 | 134 9 7 | 2462 | 132 27 1 | 2470 |
| 5 | α Arietis | W. | 93 12 21 | 2200 | 95 0 48 | 2211 | 96 48 59 | 2223 | 98 36 53 | 2234 |
| | Aldebaran | W. | 62 8 37 | 2268 | 63 55 24 | 2276 | 65 41 59 | 2285 | 67 28 21 | 2294 |
| | Pollux | W. | 18 30 53 | 2218 | 20 18 53 | 2221 | 22 6 49 | 2227 | 23 54 36 | 2235 |
| | Spica | E. | 72 32 40 | 2176 | 70 43 37 | 2188 | 68 54 51 | 2198 | 67 6 21 | 2210 |
| | Mars | E. | 84 6 30 | 2389 | 82 22 39 | 2400 | 80 39 4 | 2412 | 78 55 46 | 2424 |
| | Venus | E. | 87 41 44 | 2582 | 86 2 24 | 2593 | 84 23 20 | 2606 | 82 44 33 | 2619 |
| | Sun | E. | 123 59 23 | 2515 | 122 18 31 | 2526 | 120 37 54 | 2538 | 118 57 33 | 2549 |
| 6 | Aldebaran | W. | 76 16 41 | 2346 | 78 1 34 | 2357 | 79 46 11 | 2368 | 81 30 31 | 2380 |
| | Pollux | W. | 32 50 21 | 2283 | 34 36 45 | 2294 | 36 22 53 | 2307 | 38 8 43 | 2318 |
| | Spica | E. | 58 8 10 | 2270 | 56 21 26 | 2282 | 54 35 0 | 2295 | 52 48 53 | 2307 |
| | Mars | E. | 70 23 39 | 2488 | 68 42 9 | 2501 | 67 0 57 | 2515 | 65 20 5 | 2529 |
| | Venus | E. | 74 35 5 | 2687 | 72 58 7 | 2701 | 71 21 28 | 2715 | 69 45 8 | 2730 |
| | Sun | E. | 110 39 51 | 2610 | 109 1 10 | 2624 | 107 22 47 | 2637 | 105 44 42 | 2651 |
| 7 | Aldebaran | W. | 90 7 45 | 2444 | 91 50 17 | 2458 | 93 32 30 | 2470 | 95 14 25 | 2484 |
| | Pollux | W. | 46 53 33 | 2379 | 48 37 38 | 2392 | 50 21 24 | 2405 | 52 4 52 | 2417 |
| | Spica | E. | 44 2 58 | 2373 | 42 18 44 | 2386 | 40 34 49 | 2398 | 38 51 12 | 2412 |
| | Mars | E. | 57 0 36 | 2601 | 55 21 42 | 2615 | 53 43 8 | 2629 | 52 4 53 | 2644 |
| | Venus | E. | 61 48 25 | 2805 | 60 14 4 | 2821 | 58 40 4 | 2837 | 57 6 24 | 2852 |
| | Sun | E. | 97 38 53 | 2719 | 96 2 38 | 2733 | 94 26 42 | 2747 | 92 51 4 | 2761 |
| 8 | Pollux | W. | 60 37 43 | 2480 | 62 19 24 | 2493 | 64 0 47 | 2505 | 65 41 53 | 2517 |
| | Regulus | W. | 23 45 9 | 2479 | 25 26 52 | 2490 | 27 8 19 | 2502 | 28 49 29 | 2515 |
| | Spica | E. | 30 17 49 | 2477 | 28 36 3 | 2490 | 26 54 36 | 2503 | 25 13 27 | 2515 |
| | Mars | E. | 43 58 40 | 2719 | 42 22 26 | 2735 | 40 46 32 | 2750 | 39 10 59 | 2766 |
| | Venus | E. | 49 23 8 | 2932 | 47 51 30 | 2949 | 46 20 13 | 2965 | 44 49 17 | 2982 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Fomalhaut | W. | 106° 17′ 34″ | 2371 | 108° 1′ 51″ | 2372 | 109° 46′ 6″ | 2375 | 111° 30′ 16″ | 2380 |
| | Saturn | W. | 105 43 42 | 2091 | 107 34 55 | 2086 | 109 26 16 | 2082 | 111 17 43 | 2079 |
| | α Pegasi | W. | 84 29 23 | 2317 | 86 14 58 | 2311 | 88 0 41 | 2307 | 89 46 31 | 2303 |
| | α Arietis | W. | 41 38 39 | 2131 | 43 28 51 | 2123 | 45 19 15 | 2116 | 47 9 50 | 2109 |
| | Pollux | E. | 33 42 10 | 2092 | 31 50 59 | 2089 | 29 59 43 | 2087 | 28 8 24 | 2086 |
| | Regulus | E. | 70 28 35 | 2078 | 68 37 2 | 2073 | 66 45 21 | 2069 | 64 53 34 | 2066 |
| 2 | α Pegasi | W. | 98 36 26 | 2302 | 100 22 22 | 2306 | 102 8 13 | 2311 | 103 53 57 | 2316 |
| | α Arietis | W. | 56 24 41 | 2092 | 58 15 52 | 2092 | 60 7 4 | 2091 | 61 58 17 | 2092 |
| | Regulus | E. | 55 33 40 | 2059 | 53 41 37 | 2059 | 51 49 34 | 2061 | 49 57 34 | 2062 |
| 3 | α Arietis | W. | 71 13 43 | 2106 | 73 4 33 | 2111 | 74 55 15 | 2116 | 76 45 49 | 2122 |
| | Aldebaran | W. | 40 39 52 | 2248 | 42 27 8 | 2241 | 44 14 34 | 2237 | 46 2 6 | 2235 |
| | Regulus | E. | 40 38 34 | 2081 | 38 47 5 | 2086 | 36 55 45 | 2092 | 35 4 34 | 2099 |
| | Spica | E. | 94 38 47 | 2080 | 92 47 17 | 2085 | 90 55 55 | 2091 | 89 4 42 | 2098 |
| | Mars | E. | 105 10 21 | 2287 | 103 24 3 | 2292 | 101 37 52 | 2298 | 99 51 50 | 2305 |
| | Venus | E. | 107 51 25 | 2476 | 106 9 38 | 2481 | 104 27 58 | 2487 | 102 46 27 | 2495 |
| 4 | α Arietis | W. | 85 56 3 | 2161 | 87 45 29 | 2170 | 89 34 41 | 2180 | 91 23 39 | 2190 |
| | Aldebaran | W. | 54 59 54 | 2243 | 56 47 17 | 2249 | 58 34 32 | 2254 | 60 21 39 | 2260 |
| | Regulus | E. | 25 51 31 | 2141 | 24 1 34 | 2151 | 22 11 52 | 2161 | 20 22 26 | 2172 |
| | Spica | E. | 79 51 22 | 2137 | 78 1 20 | 2147 | 76 11 32 | 2156 | 74 21 58 | 2167 |
| | Mars | E. | 91 4 27 | 2347 | 89 19 36 | 2357 | 87 34 59 | 2367 | 85 50 37 | 2378 |
| | Venus | E. | 94 21 38 | 2538 | 92 41 18 | 2548 | 91 1 12 | 2559 | 89 21 20 | 2570 |
| | Sun | E. | 130 45 5 | 2477 | 129 3 20 | 2487 | 127 21 48 | 2496 | 125 40 29 | 2505 |
| 5 | α Arietis | W. | 100 24 30 | 2246 | 102 11 49 | 2258 | 103 58 51 | 2270 | 105 45 34 | 2263 |
| | Aldebaran | W. | 69 14 30 | 2303 | 71 0 25 | 2313 | 72 46 6 | 2324 | 74 31 31 | 2334 |
| | Pollux | W. | 25 42 12 | 2243 | 27 29 35 | 2252 | 29 16 45 | 2262 | 31 3 41 | 2272 |
| | Spica | E. | 65 18 8 | 2221 | 63 30 12 | 2233 | 61 42 33 | 2245 | 59 55 12 | 2258 |
| | Mars | E. | 77 12 45 | 2436 | 75 30 2 | 2448 | 73 47 36 | 2461 | 72 5 28 | 2475 |
| | Venus | E. | 81 6 4 | 2632 | 79 27 52 | 2645 | 77 49 58 | 2658 | 76 12 22 | 2672 |
| | Sun | E. | 117 17 28 | 2560 | 115 37 38 | 2572 | 113 58 5 | 2585 | 112 18 49 | 2598 |
| 6 | Aldebaran | W. | 83 14 34 | 2393 | 84 58 19 | 2405 | 86 41 46 | 2418 | 88 24 55 | 2431 |
| | Pollux | W. | 39 54 16 | 2330 | 41 39 32 | 2342 | 43 24 30 | 2355 | 45 9 10 | 2366 |
| | Spica | E. | 51 3 4 | 2320 | 49 17 34 | 2333 | 47 32 23 | 2346 | 45 47 31 | 2359 |
| | Mars | E. | 63 39 32 | 2543 | 61 59 19 | 2557 | 60 19 25 | 2571 | 58 39 50 | 2586 |
| | Venus | E. | 68 9 8 | 2745 | 66 33 28 | 2760 | 64 58 7 | 2775 | 63 23 6 | 2790 |
| | Sun | E. | 104 6 56 | 2664 | 102 29 28 | 2678 | 100 52 18 | 2691 | 99 15 26 | 2705 |
| 7 | Aldebaran | W. | 96 56 1 | 2497 | 98 37 18 | 2511 | 100 18 16 | 2525 | 101 58 55 | 2539 |
| | Pollux | W. | 53 48 2 | 2430 | 55 30 54 | 2443 | 57 13 28 | 2455 | 58 55 44 | 2467 |
| | Spica | E. | 37 7 54 | 2425 | 35 24 55 | 2438 | 33 42 15 | 2451 | 31 59 53 | 2464 |
| | Mars | E. | 50 26 58 | 2659 | 48 49 23 | 2674 | 47 12 8 | 2689 | 45 35 14 | 2704 |
| | Venus | E. | 55 33 4 | 2868 | 54 0 4 | 2884 | 52 27 25 | 2900 | 50 55 6 | 2916 |
| | Sun | E. | 91 15 45 | 2775 | 89 40 44 | 2789 | 88 6 2 | 2803 | 86 31 38 | 2817 |
| 8 | Pollux | W. | 67 22 42 | 2529 | 69 3 15 | 2541 | 70 43 31 | 2553 | 72 23 30 | 2565 |
| | Regulus | W. | 30 30 22 | 2527 | 32 10 58 | 2539 | 33 51 17 | 2551 | 35 31 20 | 2562 |
| | Spica | E. | 23 32 35 | 2529 | 21 52 2 | 2541 | 20 11 46 | 2554 | 18 31 48 | 2567 |
| | Mars | E. | 37 35 47 | 2782 | 36 0 55 | 2798 | 34 26 25 | 2815 | 32 52 16 | 2831 |
| | Venus | E. | 43 18 42 | 2999 | 41 48 28 | 3016 | 40 18 35 | 3033 | 38 49 3 | 3051 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Sun | E. | 84° 75′ 32″ | 2831 | 83° 23′ 44″ | 2845 | 81° 50′ 14″ | 2858 | 80° 17′ 1″ | 2872 |
| 9 | Pollux | W. | 74 3 13 | 2577 | 75 42 39 | 2588 | 77 21 50 | 2600 | 79 0 45 | 2611 |
| | Regulus | W. | 37 11 7 | 2574 | 38 50 38 | 2585 | 40 29 53 | 2597 | 42 8 52 | 2608 |
| | Mars | E. | 31 18 29 | 2849 | 29 45 5 | 2867 | 28 12 4 | 2887 | 26 39 28 | 2908 |
| | Venus | E. | 37 19 53 | 3069 | 35 51 6 | 3087 | 34 22 41 | 3106 | 32 54 39 | 3127 |
| | Sun | E. | 72 35 17 | 2939 | 71 3 47 | 2951 | 69 32 33 | 2964 | 68 1 35 | 2977 |
| 10 | Pollux | W. | 87 11 34 | 2666 | 88 49 0 | 2676 | 90 26 12 | 2687 | 92 3 10 | 2696 |
| | Regulus | W. | 50 20 3 | 2663 | 51 57 33 | 2672 | 53 34 50 | 2683 | 55 11 53 | 2692 |
| | Venus | E. | 25 40 57 | 3245 | 24 15 41 | 3275 | 22 51 0 | 3308 | 21 26 58 | 3347 |
| | Sun | E. | 60 30 40 | 3039 | 59 1 15 | 3050 | 57 32 4 | 3062 | 56 3 8 | 3074 |
| 11 | Regulus | W. | 63 13 51 | 2741 | 64 49 37 | 2750 | 66 25 10 | 2760 | 68 0 31 | 2768 |
| | Sun | E. | 48 42 4 | 3132 | 47 14 33 | 3143 | 45 47 16 | 3155 | 44 20 13 | 3166 |
| 12 | Regulus | W. | 75 54 27 | 2811 | 77 28 41 | 2818 | 79 2 45 | 2827 | 80 36 38 | 2835 |
| | Sun | E. | 37 8 22 | 3225 | 35 42 42 | 3236 | 34 17 16 | 3249 | 32 52 5 | 3262 |
| 17 | Sun | W. | 19 34 39 | 3582 | 20 53 33 | 3570 | 22 12 40 | 3560 | 23 31 58 | 3553 |
| | Saturn | E. | 47 51 16 | 3080 | 46 22 42 | 3083 | 44 54 12 | 3087 | 43 25 46 | 3090 |
| | Fomalhaut | E. | 48 37 51 | 3572 | 47 18 46 | 3601 | 46 0 13 | 3633 | 44 42 14 | 3686 |
| | α Pegasi | E. | 69 39 59 | 3324 | 68 16 15 | 3333 | 66 52 42 | 3343 | 65 29 20 | 3352 |
| | α Arietis | E. | 111 15 32 | 3080 | 109 46 58 | 3083 | 108 18 28 | 3087 | 106 50 2 | 3089 |
| 18 | Sun | W. | 30 10 7 | 3530 | 31 29 58 | 3527 | 32 49 52 | 3525 | 34 9 48 | 3523 |
| | Saturn | E. | 36 4 31 | 3103 | 34 36 25 | 3105 | 33 8 21 | 3106 | 31 40 19 | 3108 |
| | Fomalhaut | E. | 38 22 30 | 3891 | 37 9 1 | 3951 | 35 56 33 | 4017 | 34 45 10 | 4091 |
| | α Pegasi | E. | 58 35 28 | 3408 | 57 13 21 | 3422 | 55 51 29 | 3435 | 54 29 52 | 3449 |
| | α Arietis | E. | 99 28 35 | 3100 | 98 0 25 | 3101 | 96 32 17 | 3102 | 95 4 10 | 3104 |
| 19 | Sun | W. | 40 50 6 | 3512 | 42 10 17 | 3509 | 43 30 31 | 3507 | 44 50 47 | 3504 |
| | α Pegasi | E. | 47 46 13 | 3539 | 46 26 32 | 3561 | 45 7 15 | 3586 | 43 48 25 | 3613 |
| | α Arietis | E. | 87 43 51 | 3105 | 86 15 48 | 3105 | 84 47 44 | 3104 | 83 19 39 | 3103 |
| 20 | Sun | W. | 51 33 2 | 3487 | 52 53 41 | 3481 | 54 14 26 | 3477 | 55 35 16 | 3471 |
| | α Aquilæ | W. | 36 55 39 | 6520 | 37 35 41 | 6277 | 38 18 6 | 6053 | 39 2 46 | 5852 |
| | α Arietis | E. | 75 58 50 | 3093 | 74 30 32 | 3091 | 73 2 11 | 3087 | 71 33 46 | 3083 |
| | Aldebaran | E. | 107 14 7 | 3148 | 105 46 56 | 3143 | 104 19 39 | 3138 | 102 52 16 | 3134 |
| 21 | Sun | W. | 62 21 3 | 3439 | 63 42 35 | 3432 | 65 4 15 | 3423 | 66 26 5 | 3415 |
| | α Aquilæ | W. | 43 15 49 | 5082 | 44 11 40 | 4966 | 45 9 2 | 4858 | 46 7 51 | 4758 |
| | α Arietis | E. | 64 10 23 | 3060 | 62 41 24 | 3054 | 61 12 18 | 3048 | 59 43 5 | 3042 |
| | Aldebaran | E. | 95 33 48 | 3105 | 94 5 44 | 3098 | 92 37 32 | 3091 | 91 9 11 | 3084 |
| 22 | Sun | W. | 73 17 48 | 3366 | 74 40 43 | 3355 | 76 3 51 | 3344 | 77 27 12 | 3332 |
| | α Aquilæ | W. | 51 21 11 | 4353 | 52 27 15 | 4287 | 53 34 20 | 4224 | 54 42 23 | 4165 |
| | α Arietis | F. | 52 14 53 | 3005 | 50 44 46 | 2997 | 49 14 29 | 2988 | 47 44 1 | 2980 |
| | Aldebaran | E. | 83 45 4 | 3042 | 82 15 43 | 3032 | 80 46 10 | 3022 | 79 16 25 | 3012 |
| 23 | Sun | W. | 84 27 36 | 3265 | 85 52 28 | 3250 | 87 17 38 | 3235 | 88 43 6 | 3220 |
| | α Aquilæ | W. | 60 35 48 | 3915 | 61 48 53 | 3871 | 63 2 42 | 3830 | 64 17 13 | 3790 |
| | Fomalhaut | W. | 32 39 13 | 3952 | 33 51 40 | 3854 | 35 5 47 | 3766 | 36 21 25 | 3686 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Sun | E. | 78° 44′ 6″ | 2885 | 77° 11′ 28″ | 2899 | 75° 39′ 8″ | 2912 | 74° 7′ 4″ | 2925 |
| 9 | Pollux | W. | 80 39 25 | 2622 | 82 17 50 | 2634 | 83 55 59 | 2644 | 85 33 54 | 2655 |
| | Regulus | W. | 43 47 36 | 2619 | 45 26 5 | 2630 | 47 4 19 | 2641 | 48 42 18 | 2652 |
| | Mars | E. | 25 7 19 | 2930 | 23 35 38 | 2954 | 22 4 27 | 2980 | 20 33 49 | 3009 |
| | Venus | E. | 31 27 2 | 3148 | 29 59 50 | 3169 | 28 33 4 | 3193 | 27 6 46 | 3217 |
| | Sun | E. | 66 30 53 | 2989 | 65 0 27 | 3001 | 63 30 16 | 3014 | 62 0 20 | 3026 |
| 10 | Pollux | W. | 93 39 55 | 2707 | 95 16 26 | 2716 | 96 52 44 | 2726 | 98 28 49 | 2735 |
| | Regulus | W. | 56 48 43 | 2702 | 58 25 20 | 2713 | 60 1 43 | 2722 | 61 37 53 | 2732 |
| | Venus | E. | 20 3 41 | 3391 | 18 41 14 | 3443 | 17 19 46 | 3506 | 15 59 28 | 3580 |
| | Sun | E. | 54 34 27 | 3086 | 53 6 0 | 3097 | 51 37 47 | 3110 | 50 9 49 | 3120 |
| 11 | Regulus | W. | 69 35 41 | 2777 | 71 10 39 | 2785 | 72 45 26 | 2794 | 74 20 2 | 2802 |
| | Sun | E. | 42 53 23 | 3178 | 41 26 47 | 3189 | 40 0 25 | 3201 | 38 34 17 | 3212 |
| 12 | Regulus | W. | 82 10 21 | 2842 | 83 43 54 | 2850 | 85 17 17 | 2858 | 86 50 30 | 2865 |
| | Sun | E. | 31 27 9 | 3275 | 30 2 28 | 3289 | 28 38 4 | 3304 | 27 13 57 | 3320 |
| 17 | Sun | W. | 24 51 24 | 3546 | 26 10 57 | 3541 | 27 30 36 | 3537 | 28 50 19 | 3533 |
| | Saturn | E. | 41 57 24 | 3093 | 40 29 6 | 3096 | 39 0 51 | 3098 | 37 32 39 | 3101 |
| | Fomalhaut | E. | 43 24 51 | 3704 | 42 8 8 | 3745 | 40 52 8 | 3789 | 39 36 54 | 3837 |
| | α Pegasi | E. | 64 6 9 | 3363 | 62 43 10 | 3373 | 61 20 23 | 3385 | 59 57 49 | 3396 |
| | α Arietis | E. | 105 21 39 | 3091 | 103 53 19 | 3094 | 102 25 2 | 3096 | 100 56 47 | 3098 |
| 18 | Sun | W. | 35 29 47 | 3521 | 36 49 48 | 3518 | 38 9 52 | 3516 | 39 29 58 | 3515 |
| | Saturn | E. | 30 12 19 | 3109 | 28 44 20 | 3110 | 27 16 23 | 3111 | 25 48 27 | 3111 |
| | Fomalhaut | E. | 33 35 0 | 4175 | 32 26 10 | 4270 | 31 18 50 | 4377 | 30 13 8 | 4499 |
| | α Pegasi | E. | 53 8 31 | 3464 | 51 47 27 | 3481 | 50 26 42 | 3499 | 49 6 17 | 3518 |
| | α Arietis | E. | 93 36 5 | 3105 | 92 8 1 | 3105 | 90 39 57 | 3105 | 89 11 54 | 3105 |
| 19 | Sun | W. | 46 11 7 | 3501 | 47 31 30 | 3497 | 48 51 57 | 3495 | 50 12 27 | 3490 |
| | α Pegasi | E. | 42 30 5 | 3642 | 41 12 16 | 3675 | 39 55 2 | 3710 | 38 38 26 | 3750 |
| | α Arietis | E. | 81 51 33 | 3101 | 80 23 25 | 3101 | 78 55 16 | 3098 | 77 27 4 | 3096 |
| 20 | Sun | W. | 56 56 12 | 3466 | 58 17 14 | 3460 | 59 38 23 | 3454 | 60 59 39 | 3446 |
| | α Aquilæ | W. | 39 49 33 | 5669 | 40 38 21 | 5501 | 41 29 4 | 5350 | 42 21 35 | 5210 |
| | α Arietis | E. | 70 5 16 | 3079 | 68 36 41 | 3075 | 67 8 1 | 3070 | 65 39 15 | 3065 |
| | Aldebaran | E. | 101 24 48 | 3129 | 99 57 13 | 3124 | 98 29 32 | 3118 | 97 1 44 | 3111 |
| 21 | Sun | W. | 67 48 4 | 3406 | 69 10 14 | 3397 | 70 32 34 | 3387 | 71 55 5 | 3377 |
| | α Aquilæ | W. | 47 8 2 | 4664 | 48 9 32 | 4578 | 49 12 16 | 4498 | 50 16 10 | 4422 |
| | α Arietis | E. | 58 13 44 | 3035 | 56 44 15 | 3028 | 55 14 37 | 3021 | 53 44 50 | 3013 |
| | Aldebaran | E. | 89 40 42 | 3076 | 88 12 3 | 3068 | 86 43 14 | 3059 | 85 14 14 | 3051 |
| 22 | Sun | W. | 78 50 47 | 3319 | 80 14 36 | 3306 | 81 38 40 | 3293 | 83 3 0 | 3279 |
| | α Aquilæ | W. | 55 51 22 | 4110 | 57 1 14 | 4058 | 58 11 57 | 4008 | 59 23 29 | 3960 |
| | α Arietis | E. | 46 13 23 | 2970 | 44 42 33 | 2961 | 43 11 31 | 2952 | 41 40 18 | 2942 |
| | Aldebaran | E. | 77 46 27 | 3001 | 76 16 16 | 2991 | 74 45 52 | 2980 | 73 15 14 | 2969 |
| 23 | Sun | W. | 90 8 52 | 3204 | 91 34 57 | 3188 | 93 1 21 | 3171 | 94 28 5 | 3153 |
| | α Aquilæ | W. | 65 32 26 | 3751 | 66 48 19 | 3715 | 68 4 50 | 3680 | 69 21 58 | 3646 |
| | Fomalhaut | W. | 37 38 27 | 3613 | 38 56 47 | 3545 | 40 16 21 | 3483 | 41 37 4 | 3426 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|
| 23 | Saturn W. | 23° 19′ 16″ | 2905 | 24° 51′ 28″ | 2891 | 26° 23′ 58″ | 2877 | 27° 56′ 46″ | 2863 |
| | α Arietis E. | 40 8 53 | 2933 | 38 37 16 | 2924 | 37 5 28 | 2915 | 35 33 28 | 2906 |
| | Aldebaran E. | 71 44 23 | 2958 | 70 13 17 | 2946 | 68 41 57 | 2934 | 67 10 21 | 2922 |
| 24 | Sun W. | 95 55 10 | 3137 | 97 22 35 | 3119 | 98 50 22 | 3101 | 100 18 31 | 3082 |
| | α Aquilæ W. | 70 39 43 | 3613 | 71 58 3 | 3581 | 73 16 58 | 3550 | 74 36 27 | 3521 |
| | Fomalhaut W. | 42 58 51 | 3372 | 44 21 39 | 3322 | 45 45 25 | 3274 | 47 10 7 | 3230 |
| | Saturn W. | 35 45 32 | 2786 | 37 20 18 | 2769 | 38 55 26 | 2753 | 40 30 56 | 2736 |
| | Aldebaran E. | 59 28 27 | 2859 | 57 55 16 | 2846 | 56 21 48 | 2834 | 54 48 4 | 2821 |
| | Pollux E. | 102 8 26 | 2763 | 100 33 9 | 2746 | 98 57 30 | 2729 | 97 21 29 | 2713 |
| 25 | Sun W. | 107 44 58 | 2987 | 109 15 27 | 2967 | 110 46 21 | 2947 | 112 17 40 | 2927 |
| | α Aquilæ W. | 81 21 43 | 3386 | 82 44 15 | 3362 | 84 7 15 | 3339 | 85 30 41 | 3317 |
| | Fomalhaut W. | 54 26 5 | 3035 | 55 55 34 | 3001 | 57 25 46 | 2968 | 58 56 39 | 2935 |
| | Saturn W. | 48 34 13 | 2646 | 50 12 5 | 2628 | 51 50 22 | 2609 | 53 29 5 | 2590 |
| | α Pegasi W. | 33 36 36 | 3458 | 34 57 47 | 3373 | 36 20 34 | 3296 | 37 44 50 | 3225 |
| | Aldebaran E. | 46 55 24 | 2763 | 45 20 7 | 2753 | 43 44 37 | 2744 | 42 8 55 | 2735 |
| | Pollux E. | 89 15 38 | 2624 | 87 37 15 | 2605 | 85 58 27 | 2586 | 84 19 13 | 2568 |
| 26 | Sun W. | 120 0 41 | 2825 | 121 34 36 | 2805 | 123 8 57 | 2785 | 124 43 44 | 2765 |
| | α Aquilæ W. | 92 33 59 | 3220 | 93 59 45 | 3204 | 95 25 50 | 3188 | 96 52 13 | 3175 |
| | Fomalhaut W. | 66 40 52 | 2789 | 68 15 34 | 2763 | 69 50 51 | 2736 | 71 26 43 | 2711 |
| | Saturn W. | 61 49 12 | 2494 | 63 30 34 | 2475 | 65 12 23 | 2455 | 66 54 39 | 2436 |
| | α Pegasi W. | 45 5 14 | 2945 | 46 36 36 | 2899 | 48 8 56 | 2856 | 49 42 11 | 2816 |
| | Aldebaran E. | 34 8 24 | 2721 | 32 32 12 | 2726 | 30 56 7 | 2736 | 29 20 15 | 2752 |
| | Pollux E. | 75 56 33 | 2472 | 74 14 41 | 2453 | 72 32 21 | 2434 | 70 49 35 | 2415 |
| 27 | Fomalhaut W. | 79 34 12 | 2594 | 81 13 15 | 2573 | 82 52 47 | 2553 | 84 32 47 | 2533 |
| | Saturn W. | 75 32 53 | 2340 | 77 17 54 | 2322 | 79 3 22 | 2303 | 80 49 17 | 2285 |
| | α Pegasi W. | 57 40 52 | 2641 | 59 18 51 | 2611 | 60 57 31 | 2581 | 62 36 52 | 2553 |
| | Pollux E. | 62 8 53 | 2320 | 60 23 23 | 2302 | 58 37 27 | 2284 | 56 51 4 | 2266 |
| | Regulus E. | 98 59 10 | 2315 | 97 13 32 | 2296 | 95 27 26 | 2277 | 93 40 53 | 2260 |
| 28 | Fomalhaut W. | 92 59 14 | 2447 | 94 41 42 | 2433 | 96 24 30 | 2419 | 98 7 37 | 2408 |
| | Saturn W. | 89 45 24 | 2200 | 91 33 52 | 2183 | 93 22 45 | 2168 | 95 12 1 | 2153 |
| | α Pegasi W. | 71 2 40 | 2432 | 72 45 29 | 2411 | 74 28 48 | 2391 | 76 12 36 | 2373 |
| | α Arietis W. | 27 40 10 | 2278 | 29 26 42 | 2251 | 31 13 54 | 2225 | 33 1 44 | 2202 |
| | Pollux E. | 47 52 42 | 2183 | 46 3 49 | 2167 | 44 14 32 | 2153 | 42 24 53 | 2139 |
| | Regulus E. | 84 41 38 | 2174 | 82 52 32 | 2158 | 81 3 1 | 2143 | 79 13 7 | 2128 |
| 29 | Saturn W. | 104 23 45 | 2086 | 106 15 5 | 2075 | 108 6 43 | 2064 | 109 58 38 | 2054 |
| | α Pegasi W. | 84 57 50 | 2294 | 86 43 58 | 2281 | 88 30 25 | 2270 | 90 17 8 | 2260 |
| | α Arietis W. | 42 8 39 | 2111 | 43 59 22 | 2096 | 45 50 27 | 2083 | 47 41 53 | 2070 |
| | Pollux E. | 33 11 35 | 2078 | 31 20 2 | 2069 | 29 28 15 | 2060 | 27 36 14 | 2053 |
| | Regulus E. | 69 58 11 | 2061 | 68 6 12 | 2050 | 66 13 56 | 2039 | 64 21 23 | 2029 |
| 30 | α Arietis W. | 57 3 29 | 2021 | 58 56 31 | 2014 | 60 49 44 | 2008 | 62 43 6 | 2003 |
| | Regulus E. | 54 55 2 | 1989 | 53 1 11 | 1984 | 51 7 11 | 1979 | 49 13 3 | 1975 |
| | Spica E. | 108 55 29 | 1989 | 107 1 38 | 1984 | 105 7 39 | 1979 | 103 13 32 | 1975 |
| 31 | α Arietis W. | 72 11 28 | 1991 | 74 5 17 | 1991 | 75 59 6 | 1992 | 77 52 53 | 1994 |
| | Regulus E. | 39 41 15 | 1967 | 37 46 48 | 1968 | 35 52 23 | 1969 | 33 58 0 | 1972 |
| | Spica E. | 93 41 44 | 1967 | 91 47 17 | 1967 | 89 52 51 | 1968 | 87 58 27 | 1971 |

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

| Day of the Month. | Star's Name and Position. | | Midnight. | P. L. of Diff. | XVh. | P. L of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| 23 | Saturn | W. | 29° 29′ 52″ | 2848 | 31° 3′ 17″ | 2833 | 32° 37′ 2″ | 2818 | 34° 11′ 7″ | 2802 |
| | α Arietis | E. | 34 1 17 | 2898 | 32 28 55 | 2890 | 30 56 23 | 2883 | 29 23 42 | 2876 |
| | Aldebaran | E. | 65 38 30 | 2909 | 64 6 23 | 2898 | 62 34 1 | 2884 | 61 1 22 | 2872 |
| 24 | Sun | W. | 101 47 2 | 3064 | 103 15 56 | 3045 | 104 45 13 | 3026 | 106 14 54 | 3007 |
| | α Aquilæ | W. | 75 56 28 | 3492 | 77 17 1 | 3464 | 78 38 5 | 3438 | 79 59 39 | 3411 |
| | Fomalhaut | W. | 48 35 41 | 3187 | 50 2 6 | 3147 | 51 29 19 | 3108 | 52 57 19 | 3070 |
| | Saturn | W. | 42 6 48 | 2718 | 43 43 4 | 2701 | 45 19 43 | 2683 | 46 56 46 | 2665 |
| | Aldebaran | E. | 53 14 3 | 2808 | 51 39 46 | 2797 | 50 5 14 | 2785 | 48 30 26 | 2774 |
| | Pollux | E. | 95 45 6 | 2695 | 94 8 20 | 2678 | 92 31 10 | 2660 | 90 53 36 | 2642 |
| 25 | Sun | W. | 113 49 25 | 2907 | 115 21 35 | 2887 | 116 54 11 | 2866 | 118 27 13 | 2846 |
| | α Aquilæ | W. | 86 54 33 | 3295 | 88 18 50 | 3275 | 89 43 31 | 3256 | 91 8 34 | 3237 |
| | Fomalhaut | W. | 60 28 13 | 2905 | 62 0 26 | 2875 | 63 33 17 | 2845 | 65 6 46 | 2817 |
| | Saturn | W. | 55 8 14 | 2571 | 56 47 49 | 2552 | 58 27 50 | 2533 | 60 8 18 | 2514 |
| | α Pegasi | W. | 39 10 30 | 3160 | 40 37 27 | 3101 | 42 5 36 | 3045 | 43 34 53 | 2993 |
| | Aldebaran | E. | 40 33 2 | 2729 | 38 57 0 | 2724 | 37 20 52 | 2720 | 35 44 39 | 2719 |
| | Pollux | E. | 82 39 34 | 2549 | 80 59 29 | 2530 | 79 18 57 | 2510 | 77 37 58 | 2492 |
| 26 | Sun | W. | 126 18 58 | 2745 | 127 54 38 | 2725 | 129 30 45 | 2706 | 131 7 17 | 2687 |
| | α Aquilæ | W. | 98 18 52 | 3163 | 99 45 46 | 3151 | 101 12 54 | 3142 | 102 40 13 | 3133 |
| | Fomalhaut | W. | 73 3 8 | 2687 | 74 40 6 | 2662 | 76 17 37 | 2639 | 77 55 39 | 2616 |
| | Saturn | W. | 68 37 23 | 2417 | 70 20 34 | 2397 | 72 4 13 | 2378 | 73 48 19 | 2359 |
| | α Pegasi | W. | 51 16 18 | 2777 | 52 51 16 | 2741 | 54 27 2 | 2705 | 56 3 35 | 2672 |
| | Aldebaran | E. | 27 44 44 | 2774 | 26 9 42 | 2806 | 24 35 22 | 2848 | 23 1 57 | 2906 |
| | Pollux | E. | 69 6 21 | 2396 | 67 22 40 | 2376 | 65 38 31 | 2357 | 63 53 55 | 2339 |
| 27 | Fomalhaut | W. | 86 13 14 | 2515 | 87 54 7 | 2497 | 89 35 25 | 2479 | 91 17 8 | 2462 |
| | Saturn | W. | 82 35 39 | 2267 | 84 22 27 | 2249 | 86 9 41 | 2233 | 87 57 20 | 2216 |
| | α Pegasi | W. | 64 16 51 | 2527 | 65 57 26 | 2502 | 67 38 37 | 2477 | 69 20 22 | 2454 |
| | Pollux | E. | 55 4 14 | 2249 | 53 16 59 | 2231 | 51 29 18 | 2214 | 49 41 12 | 2198 |
| | Regulus | E. | 91 53 54 | 2242 | 90 6 28 | 2225 | 88 18 37 | 2207 | 86 30 20 | 2190 |
| 28 | Fomalhaut | W. | 99 51 1 | 2396 | 101 34 41 | 2386 | 103 18 36 | 2377 | 105 2 44 | 2370 |
| | Saturn | W. | 97 1 39 | 2139 | 98 51 39 | 2124 | 100 42 1 | 2111 | 102 32 43 | 2098 |
| | α Pegasi | W. | 77 56 50 | 2355 | 79 41 30 | 2338 | 81 26 34 | 2322 | 83 12 1 | 2307 |
| | α Arietis | W. | 34 50 8 | 2182 | 36 39 3 | 2162 | 38 28 28 | 2143 | 40 18 21 | 2127 |
| | Pollux | E. | 40 34 53 | 2125 | 38 44 32 | 2112 | 36 53 51 | 2100 | 35 2 52 | 2088 |
| | Regulus | E. | 77 22 50 | 2113 | 75 32 11 | 2099 | 73 41 11 | 2086 | 71 49 51 | 2073 |
| 29 | Saturn | W. | 111 50 48 | 2044 | 113 43 13 | 2036 | 115 35 51 | 2028 | 117 28 42 | 2021 |
| | α Pegasi | W. | 92 4 6 | 2251 | 93 51 17 | 2243 | 95 38 40 | 2237 | 97 26 12 | 2232 |
| | α Arietis | W. | 49 33 39 | 2058 | 51 25 43 | 2047 | 53 18 4 | 2037 | 55 10 40 | 2029 |
| | Pollux | E. | 25 44 2 | 2047 | 23 51 41 | 2043 | 21 59 14 | 2041 | 20 6 44 | 2041 |
| | Regulus | E. | 62 28 34 | 2019 | 60 35 30 | 2011 | 58 42 13 | 2003 | 56 48 43 | 1996 |
| 30 | α Arietis | W. | 64 36 36 | 1999 | 66 30 12 | 1995 | 68 23 54 | 1993 | 70 17 40 | 1991 |
| | Regulus | E. | 47 18 49 | 1972 | 45 24 30 | 1969 | 43 30 7 | 1968 | 41 35 42 | 1967 |
| | Spica | E. | 101 19 18 | 1972 | 99 24 59 | 1969 | 97 30 36 | 1968 | 95 36 11 | 1967 |
| 31 | α Arietis | W. | 79 46 37 | 1997 | 81 40 16 | 2000 | 83 33 50 | 2005 | 85 27 17 | 2010 |
| | Regulus | E. | 32 3 41 | 1975 | 30 9 27 | 1979 | 28 15 19 | 1984 | 26 21 19 | 1989 |
| | Spica | E. | 86 4 7 | 1974 | 84 9 52 | 1978 | 82 15 43 | 1982 | 80 21 41 | 1988 |

## GREENWICH MEAN TIME.

### JANUARY.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 20 31 22.68 | +12.924 | −20 36 27.2 | +44.28 | 1 49.5 |
| 2 | 20 36 32.20 | 12.869 | 20 18 26.6 | 45.76 | 1 50.7 |
| 3 | 20 41 40.38 | 12.812 | 19 59 51.1 | 47.20 | 1 51.9 |
| 4 | 20 46 47.21 | 12.755 | 19 40 41.4 | 48.60 | 1 53.1 |
| 5 | 20 51 52.67 | 12.698 | 19 20 58.2 | 49.98 | 1 54.2 |
| 6 | 20 56 56.74 | 12.640 | 19 0 42.3 | 51.34 | 1 55.3 |
| 7 | 21 1 59.43 | 12.583 | 18 39 54.4 | 52.65 | 1 56.4 |
| 8 | 21 7 0.74 | 12.525 | 18 18 35.2 | 53.94 | 1 57.5 |
| 9 | 21 12 0.66 | 12.468 | 17 56 45.5 | 55.19 | 1 58.6 |
| 10 | 21 16 59.18 | 12.411 | 17 34 26.0 | 56.42 | 1 59.7 |
| 11 | 21 21 56.30 | 12.354 | 17 11 37.7 | 57.61 | 2 0.7 |
| 12 | 21 26 52.06 | 12.296 | 16 48 21.2 | 58.77 | 2 1.6 |
| 13 | 21 31 46.44 | 12.239 | 16 24 37.3 | 59.90 | 2 2.5 |
| 14 | 21 36 39.46 | 12.183 | 16 0 26.6 | 60.99 | 2 3.4 |
| 15 | 21 41 31.14 | 12.127 | 15 35 50.0 | 62.05 | 2 4.4 |
| 16 | 21 46 21.47 | 12.072 | 15 10 48.4 | 63.09 | 2 5.3 |
| 17 | 21 51 10.53 | 12.018 | 14 45 22.5 | 64.09 | 2 6.2 |
| 18 | 21 55 58.27 | 11.964 | 14 19 33.0 | 65.05 | 2 7.0 |
| 19 | 22 0 44.77 | 11.912 | 13 53 20.8 | 65.99 | 2 7.8 |
| 20 | 22 5 30.00 | 11.860 | 13 26 46.6 | 66.89 | 2 8.6 |
| 21 | 22 10 14.00 | 11.809 | 12 59 51.1 | 67.75 | 2 9.4 |
| 22 | 22 14 56.80 | 11.758 | 12 32 35.3 | 68.58 | 2 10.2 |
| 23 | 22 19 38.42 | 11.710 | 12 4 59.8 | 69.38 | 2 16.9 |
| 24 | 22 24 18.88 | 11.663 | 11 37 5.5 | 70.14 | 2 11.6 |
| 25 | 22 28 58.22 | 11.616 | 11 8 53.2 | 70.88 | 2 12.3 |
| 26 | 22 33 36.46 | 11.571 | 10 40 23.6 | 71.58 | 2 13.0 |
| 27 | 22 38 13.63 | 11.526 | 10 11 37.7 | 72.24 | 2 13.8 |
| 28 | 22 42 49.76 | 11.484 | 9 42 36.2 | 72.88 | 2 14.5 |
| 29 | 22 47 24.87 | 11.442 | 9 13 19.9 | 73.48 | 2 15.2 |
| 30 | 22 51 58.99 | 11.401 | 8 43 49.5 | 74.05 | 2 15.8 |
| 31 | 22 56 32.14 | 11.362 | 8 14 5.9 | 74.59 | 2 16.4 |
| 32 | 23 1 4.37 | +11.324 | − 7 44 9.8 | +75.08 | 2 17.0 |

| Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. | 31st. |
|---|---|---|---|---|---|---|---|
| Semidiameter | 5″.7 | 5″.8 | 5″.9 | 6″.0 | 6″.1 | 6″.2 | 6″.3 |
| Hor. Parallax | 5.9 | 6.0 | 6.1 | 6.2 | 6.3 | 6.4 | 6.5 |

### FEBRUARY.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 23 1 4.37 | +11.324 | −7 44 9.8 | +75.08 | 2 17.0 |
| 2 | 23 5 35.73 | 11.287 | 7 14 2.2 | 75.56 | 2 17.5 |
| 3 | 23 10 6.23 | 11.253 | 6 43 43.7 | 75.99 | 2 18.1 |
| 4 | 23 14 35.91 | 11.220 | 6 13 15.2 | 76.39 | 2 18.7 |
| 5 | 23 19 4.81 | 11.189 | 5 42 37.3 | 76.77 | 2 19.2 |
| 6 | 23 23 32.97 | 11.158 | 5 11 50.8 | 77.10 | 2 19.7 |
| 7 | 23 28 0.41 | 11.129 | 4 40 56.6 | 77.41 | 2 20.2 |
| 8 | 23 32 27.18 | 11.102 | 4 9 55.3 | 77.69 | 2 20.7 |
| 9 | 23 36 53.32 | 11.076 | 3 38 47.8 | 77.93 | 2 21.2 |
| 10 | 23 41 18.86 | 11.053 | 3 7 34.7 | 78.15 | 2 21.7 |
| 11 | 23 45 43.85 | 11.031 | 2 36 16.6 | 78.35 | 2 22.2 |
| 12 | 23 50 8.36 | 11.010 | 2 4 54.4 | 78.50 | 2 22.6 |
| 13 | 23 54 32.37 | 10.992 | 1 33 28.8 | 78.63 | 2 23.1 |
| 14 | 23 58 55.97 | 10.975 | 1 2 0.5 | 78.73 | 2 23.5 |
| 15 | 0 3 19.17 | 10.960 | −0 30 30.3 | 78.79 | 2 24.0 |
| 16 | 0 7 42.05 | 10.947 | +0 1 1.2 | 78.83 | 2 24.4 |
| 17 | 0 12 4.61 | 10.934 | 0 32 33.2 | 78.84 | 2 24.9 |
| 18 | 0 16 26.91 | 10.924 | 1 4 5.2 | 78.83 | 2 25.3 |
| 19 | 0 20 48.99 | 10.916 | 1 35 36.3 | 78.78 | 2 25.7 |
| 20 | 0 25 10.89 | 10.908 | 2 7 6.0 | 78.70 | 2 26.1 |
| 21 | 0 29 32.63 | 10.903 | 2 38 33.3 | 78.58 | 2 26.5 |
| 22 | 0 33 54.27 | 10.899 | 3 9 57.7 | 78.45 | 2 26.9 |
| 23 | 0 38 15.83 | 10.897 | 3 41 18.2 | 78.27 | 2 27.3 |
| 24 | 0 42 37.36 | 10.896 | 4 12 34.3 | 78.07 | 2 27.8 |
| 25 | 0 46 58.88 | 10.897 | 4 43 45.2 | 77.84 | 2 28.2 |
| 26 | 0 51 20.43 | 10.899 | 5 14 50.3 | 77.58 | 2 28.6 |
| 27 | 0 55 42.04 | 10.902 | 5 45 48.6 | 77.29 | 2 29.0 |
| 28 | 1 0 3.74 | 10.907 | 6 16 39.6 | 76.97 | 2 29.4 |
| 29 | 1 4 25.57 | 10.912 | 6 47 22.4 | 76.62 | 2 29.8 |
| 30 | 1 8 47.54 | 10.920 | 7 17 56.4 | 76.23 | 2 30.3 |
| 31 | 1 13 9.71 | 10.928 | 7 48 20.8 | 75.82 | 2 30.7 |
| 32 | 1 17 32.08 | +10.938 | +8 18 34.9 | +75.37 | 2 31.2 |

| Day of the Month. | 5th. | 10th. | 15th. | 20th. | 25th. |
|---|---|---|---|---|---|
| Semidiameter | 6″.4 | 6″.6 | 6″.7 | 6″.9 | 7″.0 |
| Hor. Parallax | 6.6 | 6.8 | 6.9 | 7.1 | 7.3 |

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

### MARCH.

| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
|---|---|---|---|---|---|
| | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 1 8 47.54 | +10.920 | + 7 17 56.4 | +76.23 | 2 30.3 |
| 2 | 1 13 9.71 | 10.928 | 7 48 20.8 | 75.82 | 2 30.7 |
| 3 | 1 17 32.08 | 10.938 | 8 18 34.9 | 75.37 | 2 31.2 |
| 4 | 1 21 54.69 | 10.947 | 8 48 38.1 | 74.90 | 2 31.6 |
| 5 | 1 26 17.57 | 10.959 | 9 18 29.5 | 74.39 | 2 32.1 |
| 6 | 1 30 40.75 | 10.972 | 9 48 8.3 | 73.86 | 2 32.6 |
| 7 | 1 35 4.25 | 10.986 | 10 17 34.1 | 73.30 | 2 33.0 |
| 8 | 1 39 28.09 | 11.000 | 10 46 46.1 | 72.70 | 2 33.5 |
| 9 | 1 43 52.32 | 11.017 | 11 15 43.6 | 72.09 | 2 33.9 |
| 10 | 1 48 16.93 | 11.034 | 11 44 25.9 | 71.44 | 2 34.4 |
| 11 | 1 52 41.98 | 11.053 | 12 12 52.3 | 70.76 | 2 34.8 |
| 12 | 1 57 7.46 | 11.072 | 12 41 2.0 | 70.06 | 2 35.3 |
| 13 | 2 1 33.42 | 11.091 | 13 8 54.6 | 69.32 | 2 35.9 |
| 14 | 2 5 59.86 | 11.112 | 13 36 29.4 | 68.57 | 2 36.4 |
| 15 | 2 10 26.82 | 11.134 | 14 3 45.6 | 67.79 | 2 36.8 |
| 16 | 2 14 54.30 | 11.157 | 14 30 42.7 | 66.97 | 2 37.3 |
| 17 | 2 19 22.33 | 11.180 | 14 57 20.0 | 66.14 | 2 37.8 |
| 18 | 2 23 50.92 | 11.203 | 15 23 36.9 | 65.27 | 2 38.3 |
| 19 | 2 28 20.09 | 11.226 | 15 49 32.5 | 64.37 | 2 38.9 |
| 20 | 2 32 49.83 | 11.251 | 16 15 6.3 | 63.44 | 2 39.5 |
| 21 | 2 37 20.16 | 11.275 | 16 40 17.6 | 62.50 | 2 40.0 |
| 22 | 2 41 51.08 | 11.301 | 17 5 5.7 | 61.52 | 2 40.6 |
| 23 | 2 46 22.61 | 11.326 | 17 29 30.1 | 60.51 | 2 41.2 |
| 24 | 2 50 54.71 | 11.351 | 17 53 30.0 | 59.48 | 2 41.8 |
| 25 | 2 55 27.40 | 11.375 | 18 17 4.9 | 58.42 | 2 42.4 |
| 26 | 3 0 0.69 | 11.399 | 18 40 14.2 | 57.34 | 2 43.0 |
| 27 | 3 4 34.55 | 11.422 | 19 2 57.0 | 56.22 | 2 43.6 |
| 28 | 3 9 8.95 | 11.445 | 19 25 12.8 | 55.09 | 2 44.2 |
| 29 | 3 13 43.91 | 11.467 | 19 47 1.1 | 53.92 | 2 44.9 |
| 30 | 3 18 19.38 | 11.489 | 20 8 21.3 | 52.74 | 2 45.5 |
| 31 | 3 22 55.35 | 11.509 | 20 29 12.5 | 51.54 | 2 46.1 |
| 32 | 3 27 31.79 | +11.528 | +20 49 34.5 | +50.30 | 2 46.8 |

| Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. | 31st. |
|---|---|---|---|---|---|---|---|
| Semidiameter | 7″.2 | 7″.4 | 7″.6 | 7″.9 | 8″.1 | 8″.4 | 8″.7 |
| Hor. Parallax | 7.5 | 7.7 | 7.9 | 8.1 | 8.4 | 8.7 | 9.0 |

### APRIL.

| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
|---|---|---|---|---|---|
| | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 3 27 31.79 | +11.528 | +20 49 34.5 | +50.30 | 2 46.8 |
| 2 | 3 32 8.69 | 11.546 | 21 9 26.5 | 49.05 | 2 47.5 |
| 3 | 3 36 46.01 | 11.563 | 21 28 48.2 | 47.76 | 2 48.2 |
| 4 | 3 41 23.70 | 11.578 | 21 47 38.9 | 46.47 | 2 48.8 |
| 5 | 3 46 1.74 | 11.592 | 22 5 58.2 | 45.15 | 2 49.5 |
| 6 | 3 50 40.10 | 11.604 | 22 23 45.6 | 43.80 | 2 50.2 |
| 7 | 3 55 18.75 | 11.615 | 22 41 0.7 | 42.44 | 2 50.9 |
| 8 | 3 59 57.62 | 11.625 | 22 57 42.8 | 41.07 | 2 51.6 |
| 9 | 4 4 36.70 | 11.632 | 23 13 51.8 | 39.68 | 2 52.3 |
| 10 | 4 9 15.92 | 11.637 | 23 29 27.1 | 38.27 | 2 53.1 |
| 11 | 4 13 55.23 | 11.640 | 23 44 28.6 | 36.85 | 2 53.8 |
| 12 | 4 18 34.59 | 11.641 | 23 58 55.7 | 35.41 | 2 54.5 |
| 13 | 4 23 13.96 | 11.641 | 24 12 48.3 | 33.96 | 2 55.2 |
| 14 | 4 27 53.28 | 11.637 | 24 26 5.9 | 32.50 | 2 55.9 |
| 15 | 4 32 32.49 | 11.631 | 24 38 48.3 | 31.04 | 2 56.6 |
| 16 | 4 37 11.51 | 11.622 | 24 50 55.3 | 29.55 | 2 57.3 |
| 17 | 4 41 50.30 | 11.612 | 25 2 26.7 | 28.06 | 2 58.0 |
| 18 | 4 46 28.79 | 11.598 | 25 13 22.2 | 26.56 | 2 58.7 |
| 19 | 4 51 6.91 | 11.581 | 25 23 41.7 | 25.06 | 2 59.4 |
| 20 | 4 55 44.59 | 11.561 | 25 33 25.0 | 23.55 | 3 0.1 |
| 21 | 5 0 21.74 | 11.538 | 25 42 32.0 | 22.03 | 3 0.8 |
| 22 | 5 4 58.28 | 11.511 | 25 51 2.6 | 20.52 | 3 1.4 |
| 23 | 5 9 34.14 | 11.480 | 25 58 56.7 | 19.00 | 3 2.1 |
| 24 | 5 14 9.22 | 11.445 | 26 6 14.2 | 17.47 | 3 2.8 |
| 25 | 5 18 43.43 | 11.407 | 26 12 55.3 | 15.95 | 3 3.5 |
| 26 | 5 23 16.68 | 11.364 | 26 18 59.8 | 14.42 | 3 4.1 |
| 27 | 5 27 48.86 | 11.318 | 26 24 28.0 | 12.91 | 3 4.7 |
| 28 | 5 32 19.88 | 11.268 | 26 29 19.8 | 11.40 | 3 5.3 |
| 29 | 5 36 49.64 | 11.213 | 26 33 35.4 | 9.90 | 3 5.8 |
| 30 | 5 41 18.03 | 11.154 | 26 37 15.0 | 8.40 | 3 6.3 |
| 31 | 5 45 44.94 | 11.090 | 26 40 18.7 | 6.91 | 3 6.8 |
| 32 | 5 50 10.27 | +11.022 | +26 42 46.9 | + 5.43 | 3 7.3 |

| Day of the Month. | 5th. | 10th. | 15th. | 20th. | 25th. | 30th. |
|---|---|---|---|---|---|---|
| Semidiameter | 9″.0 | 9″.4 | 9″.8 | 10″.3 | 10″.8 | 11″.4 |
| Hor. Parallax | 9.4 | 9.8 | 10.2 | 10.7 | 11.2 | 11.8 |

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing: — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

### MAY.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 5 45 44.94 | +11.090 | +26 40 18.7 | + 6.91 | 3 6.8 |
| 2 | 5 50 10.27 | 11.022 | 26 42 46.9 | 5.43 | 3 7.3 |
| 3 | 5 54 33.89 | 10.949 | 26 44 39.8 | 3.97 | 3 7.7 |
| 4 | 5 58 55.71 | 10.871 | 26 45 57.8 | 2.52 | 3 8.1 |
| 5 | 6 3 15.62 | 10.789 | 26 46 41.1 | + 1.09 | 3 8.5 |
| 6 | 6 7 33.50 | 10.702 | 26 46 50.2 | − 0.33 | 3 8.8 |
| 7 | 6 11 49.24 | 10.611 | 26 46 25.3 | 1.74 | 3 9.1 |
| 8 | 6 16 2.74 | 10.515 | 26 45 27.2 | 3.12 | 3 9.4 |
| 9 | 6 20 13.87 | 10.415 | 26 43 56.3 | 4.48 | 3 9.6 |
| 10 | 6 24 22.55 | 10.310 | 26 41 52.9 | 5.81 | 3 9.8 |
| 11 | 6 28 28.63 | 10.200 | 26 39 17.8 | 7.12 | 3 10.0 |
| 12 | 6 32 32.02 | 10.085 | 26 36 11.4 | 8.40 | 3 10.1 |
| 13 | 6 36 32.60 | 9.966 | 26 32 34.3 | 9.67 | 3 10.2 |
| 14 | 6 40 30.26 | 9.842 | 26 28 27.1 | 10.91 | 3 10.2 |
| 15 | 6 44 24.89 | 9.713 | 26 23 50.5 | 12.13 | 3 10.2 |
| 16 | 6 48 16.35 | 9.578 | 26 18 45.2 | 13.31 | 3 10.1 |
| 17 | 6 52 4.54 | 9.439 | 26 13 11.8 | 14.47 | 3 10.0 |
| 18 | 6 55 49.32 | 9.295 | 26 7 11.1 | 15.59 | 3 9.8 |
| 19 | 6 59 30.57 | 9.145 | 26 0 43.8 | 16.69 | 3 9.5 |
| 20 | 7 3 8.15 | 8.990 | 25 53 50.6 | 17.75 | 3 9.2 |
| 21 | 7 6 41.93 | 8.828 | 25 46 32.3 | 18.78 | 3 8.8 |
| 22 | 7 10 11.77 | 8.661 | 25 38 49.8 | 19.77 | 3 8.3 |
| 23 | 7 13 37.52 | 8.488 | 25 30 43.9 | 20.72 | 3 7.8 |
| 24 | 7 16 59.04 | 8.308 | 25 22 15.5 | 21.64 | 3 7.2 |
| 25 | 7 20 16.17 | 8.121 | 25 13 25.6 | 22.52 | 3 6.6 |
| 26 | 7 23 28.76 | 7.929 | 25 4 15.1 | 23.36 | 3 5.9 |
| 27 | 7 26 36.64 | 7.730 | 24 54 44.8 | 24.16 | 3 5.0 |
| 28 | 7 29 39.66 | 7.523 | 24 44 55.8 | 24.92 | 3 4.1 |
| 29 | 7 32 37.62 | 7.309 | 24 34 49.0 | 25.64 | 3 3.2 |
| 30 | 7 35 30.36 | 7.086 | 24 24 25.6 | 26.33 | 3 2.1 |
| 31 | 7 38 17.68 | 6.857 | 24 13 46.5 | 26.96 | 3 0.9 |
| 32 | 7 40 59.43 | + 6.619 | +24 2 53.1 | −27.54 | 2 59.6 |

| Day of the Month. | 5th. | 10th. | 15th. | 20th. | 25th. | 30th. |
|---|---|---|---|---|---|---|
| Semidiameter | 12″.0 | 12″.8 | 13″.5 | 14″.5 | 15″.5 | 16″.7 |
| Hor. Parallax | 12.5 | 13.2 | 14.0 | 15.0 | 16.1 | 17.3 |

### JUNE.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 7 40 59.43 | +6.619 | +24 2 53.1 | −27.54 | 2 59.6 |
| 2 | 7 43 35.39 | 6.376 | 23 51 46.0 | 28.06 | 2 58.3 |
| 3 | 7 46 5.40 | 6.125 | 23 40 26.7 | 28.55 | 2 56.8 |
| 4 | 7 48 29.23 | 5.865 | 23 28 56.1 | 28.99 | 2 55.2 |
| 5 | 7 50 46.73 | 5.595 | 23 17 15.3 | 29.39 | 2 53.5 |
| 6 | 7 52 57.67 | 5.318 | 23 5 25.4 | 29.75 | 2 51.8 |
| 7 | 7 55 1.88 | 5.033 | 22 53 27.6 | 30.06 | 2 49.9 |
| 8 | 7 56 59.15 | 4.739 | 22 41 22.9 | 30.32 | 2 47.9 |
| 9 | 7 58 49.28 | 4.438 | 22 29 12.5 | 30.55 | 2 45.8 |
| 10 | 8 0 32.03 | 4.127 | 22 16 57.4 | 30.72 | 2 43.7 |
| 11 | 8 2 7.23 | 3.805 | 22 4 38.9 | 30.84 | 2 41.4 |
| 12 | 8 3 34.66 | 3.476 | 21 52 18.1 | 30.90 | 2 38.9 |
| 13 | 8 4 54.12 | 3.140 | 21 39 55.9 | 30.93 | 2 36.2 |
| 14 | 8 6 5.37 | 2.793 | 21 27 33.6 | 30.92 | 2 33.4 |
| 15 | 8 7 8.22 | 2.439 | 21 15 12.2 | 30.86 | 2 30.6 |
| 16 | 8 8 2.44 | 2.076 | 21 2 52.8 | 30.75 | 2 27.5 |
| 17 | 8 8 47.84 | 1.703 | 20 50 36.5 | 30.60 | 2 24.3 |
| 18 | 8 9 24.21 | 1.323 | 20 38 24.3 | 30.41 | 2 21.0 |
| 19 | 8 9 51.37 | 0.936 | 20 26 17.3 | 30.17 | 2 17.5 |
| 20 | 8 10 9.14 | 0.541 | 20 14 16.6 | 29.89 | 2 13.9 |
| 21 | 8 10 17.35 | +0.139 | 20 2 23.2 | 29.57 | 2 10.0 |
| 22 | 8 10 15.82 | −0.268 | 19 50 38.1 | 29.20 | 2 6.0 |
| 23 | 8 10 4.45 | 0.681 | 19 39 2.4 | 28.78 | 2 1.9 |
| 24 | 8 9 43.09 | 1.099 | 19 27 37.0 | 28.33 | 1 57.6 |
| 25 | 8 9 11.69 | 1.520 | 19 16 23.0 | 27.83 | 1 53.2 |
| 26 | 8 8 30.18 | 1.941 | 19 5 21.1 | 27.31 | 1 48.5 |
| 27 | 8 7 38.58 | 2.361 | 18 54 32.5 | 26.74 | 1 43.7 |
| 28 | 8 6 36.93 | 2.778 | 18 43 57.9 | 26.14 | 1 38.8 |
| 29 | 8 5 25.33 | 3.190 | 18 33 38.1 | 25.51 | 1 33.6 |
| 30 | 8 4 3.95 | 3.595 | 18 23 34.1 | 24.85 | 1 28.4 |
| 31 | 8 2 33.02 | 3.988 | 18 13 46.3 | 24.15 | 1 22.9 |
| 32 | 8 0 52.85 | −4.366 | +18 4 15.3 | −23.43 | 1 17.3 |

| Day of the Month. | 4th. | 9th. | 14th. | 19th. | 24th. | 29th. |
|---|---|---|---|---|---|---|
| Semidiameter | 18″.0 | 19″.5 | 21″.1 | 22″.9 | 24″.8 | 26″.5 |
| Hor. Parallax | 18.6 | 20.2 | 21.9 | 23.7 | 25.6 | 27.5 |

**Note.**—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

| | JULY. | | | | | | AUGUST. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. | Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
| | h m s | s | ° ′ ″ | ″ | h m | | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 8 2 33.02 | −3.988 | +18 13 46.3 | −24.15 | 1 22.9 | 1 | 6 58 39.84 | −1.449 | +16 2 46.0 | +3.43 | 22 13.0 |
| 2 | 8 0 52.85 | 4.366 | 18 4 15.3 | 23.43 | 1 17.3 | 2 | 6 58 10.08 | 1.030 | 16 4 16.0 | 4.07 | 22 8.7 |
| 3 | 7 59 3.81 | 4.728 | 17 55 1.8 | 22.69 | 1 11.6 | 3 | 6 57 50.31 | 0.615 | 16 6 0.7 | 4.65 | 22 4.6 |
| 4 | 7 57 6.34 | 5.070 | 17 46 6.3 | 21.92 | 1 5.7 | 4 | 6 57 40.49 | −0.203 | 16 7 58.5 | 5.17 | 22 0.6 |
| 5 | 7 55 0.96 | 5.387 | 17 37 29.7 | 21.14 | 0 59.7 | 5 | 6 57 40.51 | +0.205 | 16 10 8.1 | 5.64 | 21 56.8 |
| 6 | 7 52 48.29 | 5.678 | 17 29 12.2 | 20.33 | 0 53.5 | 6 | 6 57 50.23 | 0.606 | 16 12 28.2 | 6.04 | 21 53.2 |
| 7 | 7 50 29.03 | 5.938 | 17 21 14.4 | 19.50 | 0 47.3 | 7 | 6 58 9.48 | 1.000 | 16 14 57.0 | 6.37 | 21 49.7 |
| 8 | 7 48 3.91 | 6.166 | 17 13 36.7 | 18.65 | 0 41.0 | 8 | 6 58 38.10 | 1.387 | 16 17 33.2 | 6.65 | 21 46.4 |
| 9 | 7 45 33.72 | 6.359 | 17 6 19.5 | 17.78 | 0 34.6 | 9 | 6 59 15.89 | 1.764 | 16 20 15.1 | 6.85 | 21 43.2 |
| 10 | 7 42 59.37 | 6.514 | 16 59 23.0 | 16.90 | 0 28.1 | 10 | 7 0 2.62 | 2.131 | 16 23 1.2 | 6.99 | 21 40.2 |
| 11 | 7 40 21.79 | 6.629 | 16 52 47.9 | 16.01 | 0 21.5 | 11 | 7 0 58.07 | 2.489 | 16 25 50.0 | 7.08 | 21 37.3 |
| 12 | 7 37 41.92 | 6.705 | 16 46 34.5 | 15.10 | 0 14.9 | 12 | 7 2 1.98 | 2.836 | 16 28 39.9 | 7.09 | 21 34.5 |
| 13 | 7 35 0.74 | 6.736 | 16 40 43.2 | 14.17 | 0 8.3 | 13 | 7 3 14.12 | 3.173 | 16 31 29.6 | 7.04 | 21 31.9 |
| 14 | 7 32 19.26 | 6.729 | 16 35 14.2 | 13.23 | 0 1.7<br>23 55.1 | 14 | 7 4 34.21 | 3.499 | 16 34 17.4 | 6.95 | 21 29.4 |
| 15 | 7 29 38.47 | 6.679 | 16 30 8.2 | 12.28 | 23 48.6 | 15 | 7 6 2.00 | 3.816 | 16 37 2.3 | 6.79 | 21 27.1 |
| 16 | 7 26 59.35 | 6.589 | 16 25 25.4 | 11.31 | 23 42.0 | 16 | 7 7 37.25 | 4.121 | 16 39 42.6 | 6.56 | 21 24.9 |
| 17 | 7 24 22.85 | 6.459 | 16 21 6.1 | 10.32 | 23 35.6 | 17 | 7 9 19.71 | 4.415 | 16 42 17.1 | 6.30 | 21 22.7 |
| 18 | 7 21 49.92 | 6.292 | 16 17 10.3 | 9.32 | 23 29.2 | 18 | 7 11 9.08 | 4.700 | 16 44 44.2 | 5.97 | 21 20.7 |
| 19 | 7 19 21.40 | 6.090 | 16 13 38.6 | 8.32 | 23 22.9 | 19 | 7 13 5.16 | 4.973 | 16 47 3.1 | 5.60 | 21 18.7 |
| 20 | 7 16 58.12 | 5.854 | 16 10 30.8 | 7.31 | 23 16.7 | 20 | 7 15 7.68 | 5.238 | 16 49 12.6 | 5.18 | 21 16.9 |
| 21 | 7 14 40.89 | 5.588 | 16 7 47.2 | 6.31 | 23 10.6 | 21 | 7 17 16.45 | 5.492 | 16 51 11.4 | 4.71 | 21 15.2 |
| 22 | 7 12 30.39 | 5.293 | 16 5 27.6 | 5.31 | 23 4.6 | 22 | 7 19 31.19 | 5.737 | 16 52 58.4 | 4.19 | 21 13.6 |
| 23 | 7 10 27.23 | 4.974 | 16 3 32.1 | 4.32 | 22 58.8 | 23 | 7 21 51.70 | 5.973 | 16 54 32.2 | 3.63 | 21 12.0 |
| 24 | 7 8 31.98 | 4.633 | 16 2 0.0 | 3.34 | 22 53.1 | 24 | 7 24 17.77 | 6.199 | 16 55 52.2 | 3.03 | 21 10.6 |
| 25 | 7 6 45.15 | 4.271 | 16 0 51.4 | 2.38 | 22 47.6 | 25 | 7 26 49.19 | 6.418 | 16 56 57.2 | 2.39 | 21 9.3 |
| 26 | 7 5 7.13 | 3.892 | 16 0 5.5 | 1.44 | 22 42.1 | 26 | 7 29 25.75 | 6.628 | 16 57 46.2 | 1.70 | 21 8.1 |
| 27 | 7 3 38.32 | 3.505 | 15 59 42.0 | −0.54 | 22 36.9 | 27 | 7 32 7.27 | 6.830 | 16 58 18.4 | 0.97 | 21 6.9 |
| 28 | 7 2 18.98 | 3.106 | 15 59 39.7 | +0.34 | 22 31.7 | 28 | 7 34 53.54 | 7.025 | 16 58 32.6 | +0.21 | 21 5.7 |
| 29 | 7 1 9.32 | 2.697 | 15 59 58.0 | 1.18 | 22 26.8 | 29 | 7 37 44.40 | 7.213 | 16 58 28.1 | −0.59 | 21 4.7 |
| 30 | 7 0 9.52 | 2.284 | 16 0 35.8 | 1.97 | 22 21.9 | 30 | 7 40 39.67 | 7.393 | 16 58 3.9 | 1.42 | 21 3.8 |
| 31 | 6 59 19.66 | 1.868 | 16 1 32.3 | 2.72 | 22 17.4 | 31 | 7 43 39.19 | 7.567 | 16 57 19.4 | 2.29 | 21 2.9 |
| 32 | 6 58 39.84 | −1.449 | +16 2 46.0 | +3.43 | 22 13.0 | 32 | 7 46 42.79 | +7.733 | +16 56 13.6 | −3.19 | 21 2.1 |

| Day of the Month. | 4th. | 9th. | 14th. | 19th. | 24th. | 29th. | Day of the Month. | 3d. | 8th. | 13th. | 18th. | 22d. | 28th. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Semidiameter | 28″.0 | 29″.1 | 29″.5 | 29″.1 | 28″.0 | 26″.4 | Semidiameter | 24″.7 | 22″.9 | 21″.2 | 19″.6 | 18″.1 | 16″.9 |
| Hor. Parallax | 29.1 | 30.2 | 30.5 | 30.1 | 29.0 | 27.4 | Hor. Parallax | 25.6 | 23.7 | 21.9 | 20.3 | 18.8 | 17.5 |

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

### SEPTEMBER.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 7 46 42.79 | + 7.733 | +16 56 13.6 | − 3.19 | 21 2.1 |
| 2 | 7 49 50.30 | 7.893 | 16 51 46.1 | 4.12 | 21 1.3 |
| 3 | 7 53 1.58 | 8.047 | 16 52 55.8 | 5.07 | 21 0.6 |
| 4 | 7 56 16.47 | 8.194 | 16 50 42.4 | 6.05 | 20 59.9 |
| 5 | 7 59 34.83 | 8.335 | 16 48 4.8 | 7.07 | 20 59.3 |
| 6 | 8 2 56.51 | 8.470 | 16 45 2.7 | 8.10 | 20 58.7 |
| 7 | 8 6 21.36 | 8.600 | 16 41 35.5 | 9.15 | 20 58.3 |
| 8 | 8 9 49.25 | 8.724 | 16 37 42.9 | 10.22 | 20 57.9 |
| 9 | 8 13 20.04 | 8.842 | 16 33 24.2 | 11.32 | 20 57.5 |
| 10 | 8 16 53.59 | 8.954 | 16 28 39.1 | 12.44 | 20 57.2 |
| 11 | 8 20 29.77 | 9.061 | 16 23 27.1 | 13.57 | 20 56.9 |
| 12 | 8 24 8.49 | 9.163 | 16 17 48.0 | 14.69 | 20 56.6 |
| 13 | 8 27 49.56 | 9.259 | 16 11 41.6 | 15.83 | 20 56.3 |
| 14 | 8 31 32.91 | 9.352 | 16 5 7.7 | 16.98 | 20 56.1 |
| 15 | 8 35 18.39 | 9.439 | 15 58 6.2 | 18.14 | 20 55.9 |
| 16 | 8 39 5.91 | 9.522 | 15 50 36.7 | 19.31 | 20 55.8 |
| 17 | 8 42 55.35 | 9.599 | 15 42 39.2 | 20.48 | 20 55.7 |
| 18 | 8 46 46.63 | 9.672 | 15 34 13.5 | 21.66 | 20 55.7 |
| 19 | 8 50 39.62 | 9.742 | 15 25 19.8 | 22.83 | 20 55.7 |
| 20 | 8 54 34.23 | 9.809 | 15 15 57.8 | 24.00 | 20 55.7 |
| 21 | 8 58 30.38 | 9.870 | 15 6 7.7 | 25.17 | 20 55.7 |
| 22 | 9 2 27.99 | 9.929 | 14 55 49.3 | 26.35 | 20 55.8 |
| 23 | 9 6 26.96 | 9.985 | 14 45 2.8 | 27.52 | 20 55.8 |
| 24 | 9 10 27.23 | 10.038 | 14 33 48.3 | 28.69 | 20 55.9 |
| 25 | 9 14 28.73 | 10.087 | 14 22 5.8 | 29.85 | 20 56.0 |
| 26 | 9 18 31.38 | 10.134 | 14 9 55.4 | 31.01 | 20 56.1 |
| 27 | 9 22 35.12 | 10.178 | 13 57 17.2 | 32.17 | 20 56.2 |
| 28 | 9 26 39.89 | 10 220 | 13 44 11.4 | 33.32 | 20 56.4 |
| 29 | 9 30 45.63 | 10.258 | 13 30 38.0 | 34.46 | 20 56.6 |
| 30 | 9 34 52.29 | 10.296 | 13 16 37.4 | 35.59 | 20 56.8 |
| 31 | 9 38 59.80 | 10.330 | 13 2 9.8 | 36.71 | 20 57.0 |
| 32 | 9 43 8.13 | +10.363 | +12 47 15.3 | −37.83 | 20 57.2 |

| Day of the Month. | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. |
|---|---|---|---|---|---|---|
| Semidiameter | 15″.7 | 14″.7 | 13″.8 | 13″.0 | 12″.3 | 11″.6 |
| Hor. Parallax | 16.3 | 15.2 | 14.3 | 13.5 | 12.7 | 12.1 |

### OCTOBER.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 9 38 59.80 | +10.330 | +13 2 9.8 | −36.71 | 20 57.0 |
| 2 | 9 43 8.13 | 10.363 | 12 47 15.3 | 37.83 | 20 57.2 |
| 3 | 9 47 17.23 | 10.394 | 12 31 54.2 | 38.93 | 20 57.4 |
| 4 | 9 51 27.05 | 10.423 | 12 16 6.7 | 40.02 | 20 57.6 |
| 5 | 9 55 37.54 | 10.451 | 11 59 53.2 | 41.10 | 20 57.8 |
| 6 | 9 59 48.67 | 10.477 | 11 43 14.0 | 42.17 | 20 58.0 |
| 7 | 10 4 0.40 | 10.500 | 11 26 9.5 | 43.21 | 20 58.2 |
| 8 | 10 8 12.68 | 10.523 | 11 8 40.0 | 44.24 | 20 58.5 |
| 9 | 10 12 25.47 | 10.544 | 10 50 45.9 | 45.26 | 20 58.8 |
| 10 | 10 16 38.78 | 10.563 | 10 32 27.8 | 46.25 | 20 59.1 |
| 11 | 10 20 52.47 | 10.581 | 10 13 46.1 | 47.23 | 20 59.4 |
| 12 | 10 25 6.64 | 10.598 | 9 54 41.2 | 48.18 | 20 59.7 |
| 13 | 10 29 21.16 | 10.613 | 9 35 13.6 | 49.11 | 21 0.0 |
| 14 | 10 33 36.06 | 10.628 | 9 15 23.9 | 50.03 | 21 0.3 |
| 15 | 10 37 51.30 | 10.641 | 8 55 12.5 | 50.91 | 21 0.6 |
| 16 | 10 42 6.85 | 10.654 | 8 34 40.1 | 51.78 | 21 1.0 |
| 17 | 10 46 22.71 | 10.666 | 8 13 47.2 | 52.62 | 21 1.3 |
| 18 | 10 50 38.84 | 10.678 | 7 52 34.2 | 53.45 | 21 1.7 |
| 19 | 10 54 55.24 | 10.689 | 7 31 1.9 | 54.25 | 21 2.0 |
| 20 | 10 59 11.90 | 10.700 | 7 9 10.8 | 55.01 | 21 2.3 |
| 21 | 11 3 28.81 | 10.710 | 6 47 1.7 | 55.76 | 21 2.6 |
| 22 | 11 7 45.96 | 10.720 | 6 24 34.8 | 56.48 | 21 3.0 |
| 23 | 11 12 3.34 | 10.730 | 6 1 50.9 | 57.18 | 21 3.3 |
| 24 | 11 16 20.97 | 10.739 | 5 38 50.5 | 57.85 | 21 3.7 |
| 25 | 11 20 38.84 | 10.749 | 5 15 34.2 | 58.50 | 21 4.1 |
| 26 | 11 24 56.96 | 10.760 | 4 52 2.7 | 59.12 | 21 4.5 |
| 27 | 11 29 15.33 | 10.771 | 4 28 16.4 | 59.73 | 21 4.8 |
| 28 | 11 33 33.95 | 10.782 | 4 4 15.9 | 60.30 | 21 5.2 |
| 29 | 11 37 52.84 | 10.793 | 3 40 2.1 | 60.85 | 21 5.5 |
| 30 | 11 42 12.02 | 10.805 | 3 15 35.5 | 61.38 | 21 5.9 |
| 31 | 11 46 31.48 | 10.818 | 2 50 56.6 | 61.87 | 21 6.3 |
| 32 | 11 50 51.25 | +10.831 | + 2 26 6.1 | −62.34 | 21 6.7 |

| Day of the Month. | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. |
|---|---|---|---|---|---|---|
| Semidiameter | 11″.1 | 10″.6 | 10″.1 | 9″.7 | 9″.3 | 8″.9 |
| Hor. Parallax | 11.5 | 10.9 | 10.5 | 10.0 | 9.6 | 9.3 |

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

### NOVEMBER.

| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
|---|---|---|---|---|---|
| | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 11 50 51.25 | +10.831 | + 2 26 6.1 | −62.34 | 21 6.7 |
| 2 | 11 55 11.34 | 10.845 | 2 1 4.8 | 62.77 | 21 7.1 |
| 3 | 11 59 31.77 | 10.859 | 1 35 53.2 | 63.19 | 21 7.5 |
| 4 | 12 3 52.55 | 10.874 | 1 10 32.0 | 63.57 | 21 7.9 |
| 5 | 12 8 13.69 | 10.889 | 0 45 1.9 | 63.93 | 21 8.3 |
| 6 | 12 12 35.23 | 10.905 | + 0 19 23.5 | 64.27 | 21 8.7 |
| 7 | 12 16 57.17 | 10.922 | − 0 6 22.5 | 64.56 | 21 9.2 |
| 8 | 12 21 19.53 | 10.940 | 0 32 15.2 | 64.83 | 21 9.6 |
| 9 | 12 25 42.32 | 10.959 | 0 58 13.9 | 65.07 | 21 10.1 |
| 10 | 12 30 5.56 | 10.979 | 1 24 17.9 | 65.27 | 21 10.5 |
| 11 | 12 34 29.29 | 10.998 | 1 50 26.5 | 65.45 | 21 11.0 |
| 12 | 12 38 53.50 | 11.019 | 2 16 39.0 | 65.59 | 21 11.4 |
| 13 | 12 43 18.22 | 11.041 | 2 42 54.4 | 65.70 | 21 11.9 |
| 14 | 12 47 43.46 | 11.064 | 3 9 12.2 | 65.78 | 21 12.4 |
| 15 | 12 52 9.26 | 11.087 | 3 35 31.6 | 65.84 | 21 12.9 |
| 16 | 12 56 35.63 | 11.112 | 4 1 51.8 | 65.85 | 21 13.4 |
| 17 | 13 1 2.60 | 11.137 | 4 28 12.1 | 65.84 | 21 13.9 |
| 18 | 13 5 30.19 | 11.163 | 4 54 31.6 | 65.80 | 21 14.4 |
| 19 | 13 9 58.42 | 11.190 | 5 20 49.5 | 65.71 | 21 15.0 |
| 20 | 13 14 27.31 | 11.219 | 5 47 5.3 | 65.60 | 21 15.5 |
| 21 | 13 18 56.89 | 11.248 | 6 13 18.1 | 65.46 | 21 16.1 |
| 22 | 13 23 27.17 | 11.278 | 6 39 27.1 | 65.29 | 21 16.7 |
| 23 | 13 27 58.20 | 11.309 | 7 5 31.5 | 65.08 | 21 17.3 |
| 24 | 13 32 29.99 | 11.342 | 7 31 30.5 | 64.85 | 21 17.9 |
| 25 | 13 37 2.58 | 11.374 | 7 57 23.4 | 64.57 | 21 18.5 |
| 26 | 13 41 35.99 | 11.409 | 8 23 9.5 | 64.27 | 21 19.1 |
| 27 | 13 46 10.24 | 11.445 | 8 48 48.0 | 63.94 | 21 19.8 |
| 28 | 13 50 45.38 | 11.483 | 9 14 18.4 | 63.58 | 21 20.4 |
| 29 | 13 55 21.42 | 11.522 | 9 39 39.7 | 63.18 | 21 21.1 |
| 30 | 13 59 58.39 | 11.561 | 10 4 51.1 | 62.76 | 21 21.8 |
| 31 | 14 4 36.32 | 11.601 | 10 29 51.8 | 62.29 | 21 22.5 |
| 32 | 14 9 15.23 | +11.643 | −10 54 41.0 | −61.80 | 21 23.2 |

| Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. |
|---|---|---|---|---|---|---|
| Semidiameter | 8.″6 | 8.″3 | 8.″1 | 7.″8 | 7.″6 | 7.″4 |
| Hor. Parallax | 8.9 | 8.6 | 8.3 | 8.1 | 7.9 | 7.6 |

### DECEMBER.

| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
|---|---|---|---|---|---|
| | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 14 4 36.32 | +11.601 | −10 29 51.8 | −62.29 | 21 22.5 |
| 2 | 14 9 15.23 | 11.643 | 10 54 41.0 | 61.80 | 21 23.2 |
| 3 | 14 13 55.14 | 11.686 | 11 19 18.0 | 61.28 | 21 23.9 |
| 4 | 14 18 36.08 | 11.729 | 11 43 42.1 | 60.73 | 21 24.6 |
| 5 | 14 23 18.09 | 11.772 | 12 7 52.4 | 60.13 | 21 25.4 |
| 6 | 14 28 1.16 | 11.817 | 12 31 48.0 | 59.50 | 21 26.2 |
| 7 | 14 32 45.32 | 11.863 | 12 55 28.1 | 58.84 | 21 27.0 |
| 8 | 14 37 30.56 | 11.909 | 13 18 51.9 | 58.15 | 21 27.8 |
| 9 | 14 42 16.95 | 11.956 | 13 41 58.7 | 57.41 | 21 28.7 |
| 10 | 14 47 4.47 | 12.004 | 14 4 47.5 | 56.65 | 21 29.6 |
| 11 | 14 51 53.15 | 12.053 | 14 27 17.6 | 55.86 | 21 30.5 |
| 12 | 14 56 42.97 | 12.101 | 14 49 28.2 | 55.03 | 21 31.4 |
| 13 | 15 1 33.96 | 12.150 | 15 11 18.4 | 54.15 | 21 32.4 |
| 14 | 15 6 26.13 | 12.199 | 15 32 47.4 | 53.26 | 21 33.4 |
| 15 | 15 11 19.48 | 12.248 | 15 53 54.4 | 52.33 | 21 34.3 |
| 16 | 15 16 13.99 | 12.297 | 16 14 38.6 | 51.37 | 21 35.3 |
| 17 | 15 21 9.70 | 12.346 | 16 34 59.2 | 50.36 | 21 36.3 |
| 18 | 15 26 6.59 | 12.395 | 16 54 55.4 | 49.33 | 21 37.3 |
| 19 | 15 31 4.67 | 12.445 | 17 14 26.5 | 48.26 | 21 38.3 |
| 20 | 15 36 3.93 | 12.494 | 17 33 31.7 | 47.17 | 21 39.3 |
| 21 | 15 41 4.37 | 12.543 | 17 52 10.4 | 46.05 | 21 40.4 |
| 22 | 15 46 5.98 | 12.592 | 18 10 21.6 | 44.89 | 21 41.5 |
| 23 | 15 51 8.75 | 12.640 | 18 28 4.6 | 43.70 | 21 42.6 |
| 24 | 15 56 12.68 | 12.688 | 18 45 18.8 | 42.49 | 21 43.7 |
| 25 | 16 1 17.76 | 12.735 | 19 2 3.5 | 41.24 | 21 44.9 |
| 26 | 16 6 23.97 | 12.782 | 19 18 17.9 | 39.96 | 21 46.1 |
| 27 | 16 11 31.31 | 12.828 | 19 34 1.3 | 38.66 | 21 47.4 |
| 28 | 16 16 39.77 | 12.874 | 19 49 13.2 | 37.32 | 21 48.6 |
| 29 | 16 21 49.32 | 12.921 | 20 3 52.7 | 35.97 | 21 49.8 |
| 30 | 16 26 59.93 | 12.965 | 20 17 59.3 | 34.58 | 21 51.0 |
| 31 | 16 32 11.60 | 13.008 | 20 31 32.4 | 33.17 | 21 52.3 |
| 32 | 16 37 24.29 | +13.050 | −20 44 31.2 | −31.73 | 21 53.5 |

| Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. | 31st. |
|---|---|---|---|---|---|---|---|
| Semidiameter | 7.″2 | 7.″0 | 6.″8 | 6.″7 | 6.″5 | 6.″4 | 6.″3 |
| Hor. Parallax | 7.4 | 7.2 | 7.1 | 6.9 | 6.8 | 6.6 | 6.5 |

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

### JANUARY.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 23 20 30.13 | +6.587 | −4 55 40.1 | +45.29 | 4 38.3 |
| 2 | 23 23 8.19 | 6.582 | 4 37 32.2 | 45.35 | 4 37.0 |
| 3 | 23 25 46.13 | 6.578 | 4 19 23.0 | 45.40 | 4 35.7 |
| 4 | 23 28 23.95 | 6.573 | 4 1 12.8 | 45.44 | 4 34.4 |
| 5 | 23 31 1.65 | 6.568 | 3 43 1.6 | 45.48 | 4 33.1 |
| 6 | 23 33 39.23 | 6.563 | 3 24 49.6 | 45.51 | 4 31.8 |
| 7 | 23 36 16.70 | 6.559 | 3 6 37.0 | 45.53 | 4 30.4 |
| 8 | 23 38 54.06 | 6.554 | 2 48 24.0 | 45.55 | 4 29.1 |
| 9 | 23 41 31.30 | 6.550 | 2 30 10.7 | 45.56 | 4 27.8 |
| 10 | 23 44 8.45 | 6.546 | 2 11 57.3 | 45.56 | 4 26.5 |
| 11 | 23 46 45.51 | 6.543 | 1 53 43.8 | 45.56 | 4 25.1 |
| 12 | 23 49 22.49 | 6.540 | 1 35 30.5 | 45.55 | 4 23.8 |
| 13 | 23 51 59.40 | 6.537 | 1 17 17.5 | 45.53 | 4 22.5 |
| 14 | 23 54 36.24 | 6.534 | 0 59 4.8 | 45.51 | 4 21.2 |
| 15 | 23 57 13.02 | 6.531 | 0 40 52.7 | 45.49 | 4 19.8 |
| 16 | 23 59 49.75 | 6.529 | 0 22 41.3 | 45.46 | 4 18.5 |
| 17 | 0 2 26.42 | 6.527 | −0 4 30.7 | 45.42 | 4 17.2 |
| 18 | 0 5 3.05 | 6.525 | +0 13 38.9 | 45.37 | 4 15.8 |
| 19 | 0 7 39.65 | 6.525 | 0 31 47.3 | 45.32 | 4 14.5 |
| 20 | 0 10 16.24 | 6.524 | 0 49 54.4 | 45.26 | 4 13.2 |
| 21 | 0 12 52.82 | 6.524 | 1 8 0.1 | 45.20 | 4 11.8 |
| 22 | 0 15 29.39 | 6.524 | 1 26 4.3 | 45.14 | 4 10.5 |
| 23 | 0 18 5.97 | 6.524 | 1 44 7.1 | 45.08 | 4 9.2 |
| 24 | 0 20 42.54 | 6.525 | 2 2 8.4 | 45.01 | 4 7.8 |
| 25 | 0 23 19.13 | 6.525 | 2 20 7.6 | 44.92 | 4 6.5 |
| 26 | 0 25 55.74 | 6.526 | 2 38 4.6 | 44.83 | 4 5.1 |
| 27 | 0 28 32.37 | 6.527 | 2 55 59.5 | 44.73 | 4 3.8 |
| 28 | 0 31 9.03 | 6.528 | 3 13 52.0 | 44.64 | 4 2.5 |
| 29 | 0 33 45.72 | 6.530 | 3 31 42.0 | 44.53 | 4 1.2 |
| 30 | 0 36 22.45 | 6.532 | 3 49 29.5 | 44.41 | 3 59.9 |
| 31 | 0 38 59.22 | 6.533 | 4 7 14.1 | 44.29 | 3 58.5 |
| 32 | 0 41 36.03 | +6.535 | +4 24 55.7 | +44.16 | 3 57.2 |

| Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. | 31st. |
|---|---|---|---|---|---|---|---|
| Semidiameter | 3″.5 | 3″.4 | 3″.3 | 3″.2 | 3″.1 | 3″.0 | 3″.0 |
| Hor. Parallax | 6.1 | 5.9 | 5.7 | 5.6 | 5.5 | 5.3 | 5.2 |

### FEBRUARY.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 0 41 36.03 | +6.535 | + 4 24 55.7 | +44.16 | 3 57.2 |
| 2 | 0 44 12.88 | 6.537 | 4 42 34.1 | 44.03 | 3 55.9 |
| 3 | 0 46 49.78 | 6.539 | 5 0 9.2 | 43.89 | 3 54.5 |
| 4 | 0 49 26.74 | 6.541 | 5 17 40.8 | 43.74 | 3 53.2 |
| 5 | 0 52 3.76 | 6.543 | 5 35 8.9 | 43.59 | 3 51.9 |
| 6 | 0 54 40.85 | 6.546 | 5 52 33.2 | 43.43 | 3 50.6 |
| 7 | 0 57 18.00 | 6.549 | 6 9 53.7 | 43.26 | 3 49.3 |
| 8 | 0 59 55.23 | 6.553 | 6 27 10.1 | 43.10 | 3 47.9 |
| 9 | 1 2 32.54 | 6.556 | 6 44 22.5 | 42.93 | 3 46.6 |
| 10 | 1 5 9.95 | 6.560 | 7 1 30.6 | 42.75 | 3 45.3 |
| 11 | 1 7 47.45 | 6.564 | 7 18 34.3 | 42.56 | 3 44.0 |
| 12 | 1 10 25.04 | 6.568 | 7 35 33.3 | 42.37 | 3 42.7 |
| 13 | 1 13 2.73 | 6.573 | 7 52 27.9 | 42.17 | 3 41.4 |
| 14 | 1 15 40.54 | 6.578 | 8 9 17.7 | 41.97 | 3 40.1 |
| 15 | 1 18 18.47 | 6.583 | 8 26 2.7 | 41.77 | 3 38.8 |
| 16 | 1 20 56.53 | 6.589 | 8 42 42.7 | 41.56 | 3 37.5 |
| 17 | 1 23 34.73 | 6.595 | 8 59 17.7 | 41.35 | 3 36.2 |
| 18 | 1 26 13.08 | 6.601 | 9 15 47.5 | 41.13 | 3 34.8 |
| 19 | 1 28 51.58 | 6.608 | 9 32 12.0 | 40.91 | 3 33.5 |
| 20 | 1 31 30.23 | 6.614 | 9 48 31.2 | 40.68 | 3 32.2 |
| 21 | 1 34 9.04 | 6.621 | 10 4 44.8 | 40.44 | 3 30.9 |
| 22 | 1 36 48.02 | 6.628 | 10 20 52.7 | 40.20 | 3 29.7 |
| 23 | 1 39 27.16 | 6.635 | 10 36 54.7 | 39.96 | 3 28.4 |
| 24 | 1 42 6.48 | 6.642 | 10 52 50.8 | 39.71 | 3 27.1 |
| 25 | 1 44 45.98 | 6.649 | 11 8 40.9 | 39.46 | 3 25.8 |
| 26 | 1 47 25.66 | 6.657 | 11 24 24.9 | 39.20 | 3 24.5 |
| 27 | 1 50 5.53 | 6.664 | 11 40 2.5 | 38.93 | 3 23.3 |
| 28 | 1 52 45.58 | 6.672 | 11 55 33.7 | 38.66 | 3 22.0 |
| 29 | 1 55 25.81 | 6.680 | 12 10 58.3 | 38.38 | 3 20.7 |
| 30 | 1 58 6.23 | 6.688 | 12 26 16.1 | 38.10 | 3 19.5 |
| 31 | 2 0 46.84 | 6.696 | 12 41 27.0 | 37.81 | 3 18.2 |
| 32 | 2 3 27.65 | +6.704 | +12 56 30.9 | +37.52 | 3 16.9 |

| Day of the Month. | 5th. | 10th. | 15th. | 20th. | 25th. |
|---|---|---|---|---|---|
| Semidiameter | 2″.9 | 2″.8 | 2″.8 | 2″.7 | 2″.7 |
| Hor. Parallax | 5.1 | 5.0 | 4.9 | 4.8 | 4.7 |

**Note.**—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

### MARCH.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 1 58 6.23 | +6.688 | +12 26 16.1 | +38.10 | 3 19.5 |
| 2 | 2 0 46.84 | 6.696 | 12 41 27.0 | 37.81 | 3 18.2 |
| 3 | 2 3 27.65 | 6.704 | 12 56 30.9 | 37.51 | 3 16.9 |
| 4 | 2 6 8.65 | 6.712 | 13 11 27.6 | 37.21 | 3 15.7 |
| 5 | 2 8 49.85 | 6.720 | 13 26 17.2 | 36.90 | 3 14.4 |
| 6 | 2 11 31.24 | 6.729 | 13 40 59.4 | 36.60 | 3 13.2 |
| 7 | 2 14 12.83 | 6.737 | 13 55 34.1 | 36.28 | 3 11.9 |
| 8 | 2 16 54.62 | 6.746 | 14 10 1.3 | 35.97 | 3 10.7 |
| 9 | 2 19 36.62 | 6.754 | 14 24 20.9 | 35.65 | 3 9.4 |
| 10 | 2 22 18.82 | 6.763 | 14 38 32.7 | 35.32 | 3 8.2 |
| 11 | 2 25 1.23 | 6.771 | 14 52 36.5 | 34.99 | 3 6.9 |
| 12 | 2 27 43.86 | 6.780 | 15 6 32.3 | 34.65 | 3 5.7 |
| 13 | 2 30 26.71 | 6.790 | 15 20 20.0 | 34.31 | 3 4.5 |
| 14 | 2 33 9.78 | 6.799 | 15 33 59.6 | 33.97 | 3 3.2 |
| 15 | 2 35 53.08 | 6.809 | 15 47 30.9 | 33.62 | 3 2.0 |
| 16 | 2 38 36.62 | 6.819 | 16 0 53.8 | 33.27 | 3 0.8 |
| 17 | 2 41 20.39 | 6.829 | 16 14 8.2 | 32.91 | 2 59.6 |
| 18 | 2 44 4.40 | 6.839 | 16 27 14.0 | 32.55 | 2 58.4 |
| 19 | 2 46 48.65 | 6.849 | 16 40 11.1 | 32.19 | 2 57.2 |
| 20 | 2 49 33.14 | 6.859 | 16 52 59.5 | 31.83 | 2 56.0 |
| 21 | 2 52 17.87 | 6.869 | 17 5 39.0 | 31.46 | 2 54.8 |
| 22 | 2 55 2.85 | 6.879 | 17 18 9.6 | 31.08 | 2 53.6 |
| 23 | 2 57 48.07 | 6.889 | 17 30 31.1 | 30.70 | 2 52.4 |
| 24 | 3 0 33.53 | 6.899 | 17 42 43.4 | 30.31 | 2 51.3 |
| 25 | 3 3 19.22 | 6.909 | 17 54 46.4 | 29.93 | 2 50.1 |
| 26 | 3 6 5.16 | 6.919 | 18 6 40.0 | 29.53 | 2 48.9 |
| 27 | 3 8 51.35 | 6.929 | 18 18 24.1 | 29.13 | 2 47.7 |
| 28 | 3 11 37.77 | 6.939 | 18 29 58.7 | 28.73 | 2 46.6 |
| 29 | 3 14 24.42 | 6.949 | 18 41 23.5 | 28.32 | 2 45.4 |
| 30 | 3 17 11.31 | 6.958 | 18 52 38.5 | 27.91 | 2 44.3 |
| 31 | 3 19 58.42 | 6.968 | 19 3 43.6 | 27.51 | 2 43.1 |
| 32 | 3 22 45.76 | +6.977 | +19 14 38.7 | +27.09 | 2 41.9 |

| Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. | 31st. |
|---|---|---|---|---|---|---|---|
| Semidiameter | 2″.6 | 2″.6 | 2″.5 | 2″.5 | 2″.4 | 2″.4 | 2″.4 |
| Hor. Parallax | 4.6 | 4.5 | 4.4 | 4.3 | 4.3 | 4.2 | 4.1 |

### APRIL.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 3 22 45.76 | +6.977 | +19 14 38.7 | +27.09 | 2 41.9 |
| 2 | 3 25 33.31 | 6.986 | 19 25 23.7 | 26.66 | 2 40.8 |
| 3 | 3 28 21.08 | 6.995 | 19 35 58.5 | 26.24 | 2 39.6 |
| 4 | 3 31 9.07 | 7.004 | 19 46 23.1 | 25.81 | 2 38.5 |
| 5 | 3 33 57.27 | 7.013 | 19 56 37.4 | 25.37 | 2 37.4 |
| 6 | 3 36 45.69 | 7.021 | 20 6 41.2 | 24.94 | 2 36.3 |
| 7 | 3 39 34.32 | 7.030 | 20 16 34.5 | 24.50 | 2 35.1 |
| 8 | 3 42 23.15 | 7.039 | 20 26 17.2 | 24.06 | 2 34.0 |
| 9 | 3 45 12.18 | 7.047 | 20 35 49.4 | 23.61 | 2 32.9 |
| 10 | 3 48 1.42 | 7.055 | 20 45 10.8 | 23.16 | 2 31.7 |
| 11 | 3 50 50.85 | 7.064 | 20 54 21.3 | 22.71 | 2 30.6 |
| 12 | 3 53 40.49 | 7.072 | 21 3 21.0 | 22.25 | 2 29.5 |
| 13 | 3 56 30.32 | 7.081 | 21 12 9.8 | 21.80 | 2 28.4 |
| 14 | 3 59 20.36 | 7.088 | 21 20 47.7 | 21.34 | 2 27.3 |
| 15 | 4 2 10.59 | 7.096 | 21 29 14.7 | 20.88 | 2 26.2 |
| 16 | 4 5 1.01 | 7.104 | 21 37 30.5 | 20.41 | 2 25.1 |
| 17 | 4 7 51.62 | 7.112 | 21 45 35.1 | 19.95 | 2 24.0 |
| 18 | 4 10 42.41 | 7.120 | 21 53 28.6 | 19.49 | 2 22.9 |
| 19 | 4 13 33.39 | 7.127 | 22 1 10.8 | 19.03 | 2 21.8 |
| 20 | 4 16 24.54 | 7.134 | 22 8 41.7 | 18.55 | 2 20.7 |
| 21 | 4 19 15.86 | 7.141 | 22 16 1.2 | 18.07 | 2 19.6 |
| 22 | 4 22 7.35 | 7.148 | 22 23 9.2 | 17.59 | 2 18.5 |
| 23 | 4 24 58.99 | 7.155 | 22 30 5.7 | 17.11 | 2 17.5 |
| 24 | 4 27 50.79 | 7.161 | 22 36 50.7 | 16.63 | 2 16.4 |
| 25 | 4 30 42.74 | 7.167 | 22 43 24.0 | 16.14 | 2 15.3 |
| 26 | 4 33 34.81 | 7.173 | 22 49 45.6 | 15.65 | 2 14.3 |
| 27 | 4 36 27.02 | 7.178 | 22 55 55.6 | 15.16 | 2 13.2 |
| 28 | 4 39 19.35 | 7.183 | 23 1 53.8 | 14.67 | 2 12.1 |
| 29 | 4 42 11.80 | 7.187 | 23 7 40.1 | 14.17 | 2 11.0 |
| 30 | 4 45 4.35 | 7.191 | 23 13 14.5 | 13.68 | 2 9.9 |
| 31 | 4 47 56.98 | 7.195 | 23 18 37.1 | 13.19 | 2 8.8 |
| 32 | 4 50 49.71 | +7.199 | +23 23 47.8 | +12.69 | 2 7.8 |

| Day of the Month. | 5th. | 10th. | 15th. | 20th. | 25th. | 30th. |
|---|---|---|---|---|---|---|
| Semidiameter | 2″.3 | 2″.3 | 2″.2 | 2″.2 | 2″.2 | 2″.2 |
| Hor. Parallax | 4.1 | 4.0 | 3.9 | 3.9 | 3.8 | 3.8 |

**+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing: — indicates that north declinations are decreasing and south declinations increasing.**

# MARS, 1876.

## GREENWICH MEAN TIME.

| MAY. | | | | | | JUNE. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ′ ″ | ″ | h m | | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 4 47 56.98 | +7.195 | +23 18 37.1 | +13.19 | 2 8.8 | 1 | 6 17 18.26 | +7.165 | +24 25 33.8 | − 2.40 | 1 36.0 |
| 2 | 4 50 49.71 | 7.198 | 23 23 47.8 | 12.60 | 2 7.8 | 2 | 6 20 10.14 | 7.158 | 24 24 30.5 | 2.89 | 1 34.9 |
| 3 | 4 53 42.52 | 7.201 | 23 28 46.4 | 12.19 | 2 6.7 | 3 | 6 23 1.87 | 7.151 | 24 23 15.5 | 3.37 | 1 33.8 |
| 4 | 4 56 35.40 | 7.204 | 23 33 33.1 | 11.69 | 2 5.7 | 4 | 6 25 53.43 | 7.144 | 24 21 48.8 | 3.86 | 1 32.8 |
| 5 | 4 59 28.35 | 7.207 | 23 38 7.8 | 11.19 | 2 4.6 | 5 | 6 28 44.81 | 7.137 | 24 20 10.4 | 4.35 | 1 31.7 |
| 6 | 5 2 21.35 | 7.210 | 23 42 30.5 | 10.68 | 2 3.5 | 6 | 6 31 36.01 | 7.130 | 24 18 20.3 | 4.83 | 1 30.6 |
| 7 | 5 5 14.41 | 7.212 | 23 46 41.1 | 10.18 | 2 2.5 | 7 | 6 34 27.02 | 7.122 | 24 16 18.6 | 5.32 | 1 29.5 |
| 8 | 5 8 7.51 | 7.214 | 23 50 39.5 | 9.68 | 2 1.4 | 8 | 6 37 17.84 | 7.114 | 24 14 5.2 | 5.80 | 1 28.4 |
| 9 | 5 11 0.65 | 7.215 | 23 54 26.0 | 9.18 | 2 0.4 | 9 | 6 40 8.47 | 7.106 | 24 11 40.3 | 6.28 | 1 27.3 |
| 10 | 5 13 53.83 | 7.216 | 23 58 0.4 | 8.67 | 1 59.3 | 10 | 6 42 58.91 | 7.097 | 24 9 3.9 | 6.76 | 1 26.2 |
| 11 | 5 16 47.04 | 7.218 | 24 1 22.7 | 8.17 | 1 58.3 | 11 | 6 45 49.13 | 7.088 | 24 6 16.0 | 7.23 | 1 25.1 |
| 12 | 5 19 40.27 | 7.219 | 24 4 33.0 | 7.66 | 1 57.2 | 12 | 6 48 39.14 | 7.079 | 24 3 16.8 | 7.71 | 1 24.0 |
| 13 | 5 22 33.52 | 7.219 | 24 7 31.1 | 7.16 | 1 56.2 | 13 | 6 51 28.93 | 7.070 | 24 0 6.2 | 8.18 | 1 22.9 |
| 14 | 5 25 26.78 | 7.219 | 24 10 17.0 | 6.65 | 1 55.1 | 14 | 6 54 18.50 | 7.061 | 23 56 44.3 | 8.65 | 1 21.7 |
| 15 | 5 28 20.03 | 7.219 | 24 12 50.8 | 6.15 | 1 54.1 | 15 | 6 57 7.85 | 7.051 | 23 53 11.1 | 9.12 | 1 20.6 |
| 16 | 5 31 13.29 | 7.219 | 24 15 12.5 | 5.64 | 1 53.0 | 16 | 6 59 56.97 | 7.041 | 23 49 26.8 | 9.59 | 1 19.5 |
| 17 | 5 34 6.54 | 7.218 | 24 17 22.1 | 5.14 | 1 52.0 | 17 | 7 2 45.84 | 7.031 | 23 45 31.4 | 10.09 | 1 18.3 |
| 18 | 5 36 59.78 | 7.217 | 24 19 19.6 | 4.63 | 1 50.9 | 18 | 7 5 34.46 | 7.020 | 23 41 24.9 | 10.51 | 1 17.2 |
| 19 | 5 39 52.99 | 7.216 | 24 21 4.9 | 4.13 | 1 49.8 | 19 | 7 8 22.83 | 7.009 | 23 37 7.4 | 10.96 | 1 16.1 |
| 20 | 5 42 46.16 | 7.214 | 24 22 38.1 | 3.62 | 1 48.8 | 20 | 7 11 10.94 | 6.998 | 23 32 39.0 | 11.42 | 1 14.9 |
| 21 | 5 45 39.29 | 7.212 | 24 23 59.2 | 3.11 | 1 47.7 | 21 | 7 13 58.78 | 6.987 | 23 27 59.7 | 11.87 | 1 13.8 |
| 22 | 5 48 32.37 | 7.210 | 24 25 8.1 | 2.61 | 1 46.7 | 22 | 7 16 46.35 | 6.976 | 23 23 9.6 | 12.32 | 1 12.6 |
| 23 | 5 51 25.40 | 7.207 | 24 26 4.8 | 2.10 | 1 45.6 | 23 | 7 19 33.65 | 6.964 | 23 18 8.8 | 12.76 | 1 11.5 |
| 24 | 5 54 18.36 | 7.204 | 24 26 49.4 | 1.60 | 1 44.5 | 24 | 7 22 20.67 | 6.952 | 23 12 57.3 | 13.20 | 1 10.3 |
| 25 | 5 57 11.22 | 7.201 | 24 27 22.0 | 1.10 | 1 43.5 | 25 | 7 25 7.39 | 6.940 | 23 7 35.2 | 13.64 | 1 9.2 |
| 26 | 6 0 3.99 | 7.197 | 24 27 42.5 | 0.60 | 1 42.4 | 26 | 7 27 53.81 | 6.928 | 23 2 2.6 | 14.08 | 1 8.0 |
| 27 | 6 2 56.66 | 7.192 | 24 27 51.0 | + 0.10 | 1 41.3 | 27 | 7 30 39.93 | 6.915 | 22 56 19.6 | 14.51 | 1 6.8 |
| 28 | 6 5 49.23 | 7.188 | 24 27 47.4 | − 0.40 | 1 40.2 | 28 | 7 33 25.73 | 6.902 | 22 50 26.4 | 14.93 | 1 5.7 |
| 29 | 6 8 41.69 | 7.183 | 24 27 31.9 | 0.90 | 1 39.2 | 29 | 7 36 11.22 | 6.889 | 22 44 23.0 | 15.36 | 1 4.5 |
| 30 | 6 11 34.02 | 7.177 | 24 27 4.5 | 1.40 | 1 38.1 | 30 | 7 38 56.39 | 6.876 | 22 38 9.3 | 15.79 | 1 3.2 |
| 31 | 6 14 26.22 | 7.171 | 24 26 25.1 | 1.90 | 1 37.1 | 31 | 7 41 41.24 | 6.862 | 22 31 45.6 | 16.20 | 1 2.1 |
| 32 | 6 17 18.26 | +7.165 | +24 25 33.8 | − 2.40 | 1 36.0 | 32 | 7 44 25.77 | +6.849 | +22 25 12.0 | −16.62 | 1 0.9 |

| Day of the Month. | 5th. | 10th. | 15th. | 20th. | 25th. | 30th. | Day of the Month. | 4th. | 9th. | 14th. | 19th. | 24th. | 29th. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Semidiameter | 2″.1 | 2″.1 | 2″.1 | 2″.1 | 2″.0 | 2″.0 | Semidiameter | 2″.0 | 2″.0 | 2″.0 | 2″.0 | 1″.9 | 1″.9 |
| Hor. Parallax | 3.7 | 3.7 | 3.7 | 3.6 | 3.6 | 3.5 | Hor. Parallax | 3.5 | 3.5 | 3.5 | 3.4 | 3.4 | 3.4 |

NOTE.—North declinations are marked +, south declinations −.

### GREENWICH MEAN TIME.

| JULY. | | | | | | AUGUST. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. | Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
| | h m s | s | ° ′ ″ | ″ | h m | | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 7 41 41.24 | +6.862 | +22 31 45.6 | −16.20 | 1 2.1 | 1 | 9 4 4.74 | +6.421 | +17 58 0.4 | −27.34 | 0 22.3 |
| 2 | 7 44 25.77 | 6.849 | 22 25 12.0 | 16.62 | 1 0.9 | 2 | 9 6 38.69 | 6.407 | 17 47 0.8 | 27.64 | 0 20.9 |
| 3 | 7 47 9.98 | 6.835 | 22 18 28.5 | 17.03 | 0 59.7 | 3 | 9 9 12.29 | 6.393 | 17 35 54.1 | 27.93 | 0 19.6 |
| 4 | 7 49 53.85 | 6.821 | 22 11 35.0 | 17.44 | 0 58.5 | 4 | 9 11 45.57 | 6.379 | 17 24 40.5 | 28.21 | 0 18.2 |
| 5 | 7 52 37.39 | 6.807 | 22 4 31.8 | 17.84 | 0 57.3 | 5 | 9 14 18.51 | 6.366 | 17 13 20.0 | 28.49 | 0 16.8 |
| 6 | 7 55 20.60 | 6.793 | 21 57 19.0 | 18.24 | 0 56.1 | 6 | 9 16 51.12 | 6.352 | 17 1 52.8 | 28.77 | 0 15.4 |
| 7 | 7 58 3.47 | 6.779 | 21 49 56.6 | 18.64 | 0 54.8 | 7 | 9 19 23.40 | 6.339 | 16 50 18.8 | 29.05 | 0 14.0 |
| 8 | 8 0 46.01 | 6.765 | 21 42 24.7 | 19.03 | 0 53.6 | 8 | 9 21 55.37 | 6.326 | 16 38 38.1 | 39.32 | 0 12.6 |
| 9 | 8 3 28.21 | 6.751 | 21 34 43.4 | 19.42 | 0 52.4 | 9 | 9 24 27.02 | 6.313 | 16 26 51.1 | 29.59 | 0 11.1 |
| 10 | 8 6 10.07 | 6.738 | 21 26 52.7 | 19.80 | 0 51.1 | 10 | 9 26 58.37 | 6.300 | 16 14 57.7 | 29.86 | 0 9.7 |
| 11 | 8 8 51.61 | 6.724 | 21 18 52.9 | 20.19 | 0 49.9 | 11 | 9 29 29.40 | 6.287 | 16 2 57.8 | 30.13 | 0 8.3 |
| 12 | 8 11 32.81 | 6.709 | 21 10 43.9 | 20.57 | 0 48.6 | 12 | 9 32 0.14 | 6.275 | 15 50 51.8 | 30.39 | 0 6.9 |
| 13 | 8 14 13.67 | 6.695 | 21 2 25.7 | 20.94 | 0 47.4 | 13 | 9 34 30.58 | 6.262 | 15 38 39.6 | 30.64 | 0 5.4 |
| 14 | 8 16 54.19 | 6.681 | 20 53 58.6 | 21.31 | 0 46.1 | 14 | 9 37 0.72 | 6.250 | 15 26 21.3 | 30.89 | 4.0 |
| 15 | 8 19 34.37 | 6.667 | 20 45 22.6 | 21.68 | 0 44.8 | 15 | 9 39 30.56 | 6.237 | 15 13 57.0 | 31.13 | 0 2.5 |
| 16 | 8 22 14.22 | 6.653 | 20 36 37.8 | 22.05 | 0 43.5 | 16 | 9 42 0.10 | 6.225 | 15 1 26.9 | 31.37 | 0<br>0 1.1<br>23 59.6 |
| 17 | 8 24 53.72 | 6.639 | 20 27 44.2 | 22.42 | 0 42.3 | 17 | 9 44 29.35 | 6.213 | 14 48 51.1 | 31.61 | 23 58.2 |
| 18 | 8 27 32.88 | 6.623 | 20 18 41.9 | 22.78 | 0 41.0 | 18 | 9 46 58.32 | 6.202 | 14 36 9.6 | 31.85 | 23 56.7 |
| 19 | 8 30 11.69 | 6.610 | 20 9 31.2 | 23.13 | 0 39.7 | 19 | 9 49 27.01 | 6.190 | 14 23 22.5 | 32.08 | 23 55.2 |
| 20 | 8 32 50.16 | 6.596 | 20 0 12.0 | 23.48 | 0 38.3 | 20 | 9 51 55.41 | 6.178 | 14 10 29.9 | 32.30 | 23 53.8 |
| 21 | 8 35 28.31 | 6.582 | 19 50 44.5 | 23.82 | 0 37.0 | 21 | 9 54 23.54 | 6.166 | 13 57 32.0 | 32.51 | 23 52.3 |
| 22 | 8 38 6.11 | 6.568 | 19 41 8.8 | 24.16 | 0 35.7 | 22 | 9 56 51.38 | 6.155 | 13 44 28.9 | 32.73 | 23 50.8 |
| 23 | 8 40 43.55 | 6.553 | 19 31 24.9 | 24.50 | 0 34.4 | 23 | 9 59 18.95 | 6.144 | 13 31 20.7 | 32.94 | 23 49.3 |
| 24 | 8 43 20.64 | 6.538 | 19 21 32.9 | 24.83 | 0 33.1 | 24 | 10 1 46.26 | 6.132 | 13 18 7.5 | 33.15 | 23 47.8 |
| 25 | 8 45 57.37 | 6.523 | 19 11 33.0 | 25.16 | 0 31.8 | 25 | 10 4 13.29 | 6.121 | 13 4 49.5 | 33.36 | 23 46.3 |
| 26 | 8 48 33.75 | 6.508 | 19 1 25.3 | 25.48 | 0 30.4 | 26 | 10 6 40.06 | 6.110 | 12 51 26.6 | 33.56 | 23 44.9 |
| 27 | 8 51 9.79 | 6.494 | 18 51 9.9 | 25.80 | 0 29.1 | 27 | 10 9 6.56 | 6.099 | 12 37 58.9 | 33.75 | 23 43.4 |
| 28 | 8 53 45.47 | 6.480 | 18 40 46.9 | 26.12 | 0 27.8 | 28 | 10 11 32.81 | 6.088 | 12 24 26.6 | 33.94 | 23 41.9 |
| 29 | 8 56 20.82 | 6.465 | 18 30 16.4 | 26.43 | 0 26.4 | 29 | 10 13 58.80 | 6.078 | 12 10 49.8 | 34.13 | 23 40.3 |
| 30 | 8 58 55.81 | 6.450 | 18 19 38.4 | 26.74 | 0 25.0 | 30 | 10 16 24.56 | 6.068 | 11 57 8.5 | 34.31 | 23 38.8 |
| 31 | 9 1 30.45 | 6.436 | 18 8 53.0 | 27.04 | 0 23.6 | 31 | 10 18 50.08 | 6.058 | 11 43 22.9 | 34.49 | 23 37.3 |
| 32 | 9 4 4.74 | +6.421 | +17 58 0.4 | −27.34 | 0 22.3 | 32 | 10 21 15.36 | +6.048 | +11 29 33.0 | −34.66 | 23 35.8 |

| Day of the Month. | 4th. | 9th. | 14th. | 19th. | 24th. | 29th. | Day of the Month. | 3d. | 8th. | 13th. | 18th. | 23d. | 28th. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Semidiameter | 1″.9 | 1″.9 | 1″.9 | 1″.9 | 1″.9 | 1″.9 | Semidiameter | 1″.9 | 1″.9 | 1″.9 | 1″.9 | 1″.9 | 1″.9 |
| Hor. Parallax | 3.4 | 3.4 | 3.3 | 3.3 | 3.3 | 3.3 | Hor. Parallax | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

### SEPTEMBER.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 10 21 15.36 | +6.048 | +11 29 33.0 | −34.66 | 23 35.8 |
| 2 | 10 23 40.41 | 6.039 | 11 15 39.0 | 34.84 | 23 34.3 |
| 3 | 10 26 5.24 | 6.030 | 11 1 40.8 | 35.01 | 23 32.7 |
| 4 | 10 28 29.85 | 6.022 | 10 47 38.7 | 35.18 | 23 31.2 |
| 5 | 10 30 54.26 | 6.013 | 10 33 32.7 | 35.34 | 23 29.6 |
| 6 | 10 33 18.47 | 6.005 | 10 19 22.8 | 35.49 | 23 28.1 |
| 7 | 10 35 42.49 | 5.997 | 10 5 9.1 | 35.65 | 23 26.6 |
| 8 | 10 38 6.33 | 5.989 | 9 50 51.8 | 35.80 | 23 25.0 |
| 9 | 10 40 29.97 | 5.982 | 9 36 30.9 | 35.95 | 23 23.5 |
| 10 | 10 42 53.44 | 5.975 | 9 22 6.4 | 36.09 | 23 21.9 |
| 11 | 10 45 16.73 | 5.968 | 9 7 38.5 | 36.23 | 23 20.4 |
| 12 | 10 47 39.85 | 5.960 | 8 53 7.3 | 36.36 | 23 18.8 |
| 13 | 10 50 2.82 | 5.953 | 8 38 33.0 | 36.49 | 23 17.2 |
| 14 | 10 52 25.63 | 5.947 | 8 23 55.5 | 36.62 | 23 15.8 |
| 15 | 10 54 48.29 | 5.941 | 8 9 14.9 | 36.75 | 23 14.1 |
| 16 | 10 57 10.80 | 5.935 | 7 54 31.3 | 36.87 | 23 12.5 |
| 17 | 10 59 33.17 | 5.929 | 7 39 44.9 | 36.99 | 23 11.0 |
| 18 | 11 1 55.40 | 5.923 | 7 24 55.8 | 37.10 | 23 9.4 |
| 19 | 11 4 17.49 | 5.918 | 7 10 4.2 | 37.21 | 23 7.8 |
| 20 | 11 6 39.46 | 5.912 | 6 55 10.0 | 37.31 | 23 6.2 |
| 21 | 11 9 1.29 | 5.907 | 6 40 13.5 | 37.41 | 23 4.7 |
| 22 | 11 11 23.01 | 5.902 | 6 25 14.7 | 37.50 | 23 3.1 |
| 23 | 11 13 44.61 | 5.898 | 6 10 13.6 | 37.59 | 23 1.5 |
| 24 | 11 16 6.09 | 5.893 | 5 55 10.4 | 37.67 | 22 59.9 |
| 25 | 11 18 27.46 | 5.889 | 5 40 5.2 | 37.75 | 22 58.3 |
| 26 | 11 20 48.73 | 5.885 | 5 24 58.1 | 37.83 | 22 56.8 |
| 27 | 11 23 9.91 | 5.881 | 5 9 49.2 | 37.90 | 22 55.2 |
| 28 | 11 25 31.00 | 5 878 | 4 54 38.6 | 37.98 | 22 53.6 |
| 29 | 11 27 52.02 | 5.875 | 4 39 26.2 | 38.05 | 22 52.0 |
| 30 | 11 30 12.97 | 5.872 | 4 24 12.2 | 38.11 | 22 50.4 |
| 31 | 11 32 33.85 | 5.869 | 4 8 56.8 | 38.17 | 22 48.8 |
| 32 | 11 34 54.66 | +5.866 | + 3 53 40.1 | −38.23 | 22 47.2 |

| Day of the Month. | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. |
|---|---|---|---|---|---|---|
| Semidiameter | 1″.9 | 1″.9 | 1″.9 | 1″.9 | 1″.9 | 1″.9 |
| Hor. Parallax | 3.3 | 3.3 | 3.3 | 3.4 | 3.4 | 3.4 |

### OCTOBER.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 11 32 33.85 | +5.869 | +4 8 56.8 | −38.17 | 22 48.8 |
| 2 | 11 34 54.66 | 5.866 | 3 53 40.1 | 38.23 | 22 47.2 |
| 3 | 11 37 15.43 | 5.864 | 3 38 22.0 | 38.29 | 22 45.6 |
| 4 | 11 39 36.15 | 5.862 | 3 23 2.4 | 38.34 | 22 44.0 |
| 5 | 11 41 56.84 | 5.861 | 3 7 41.7 | 38.39 | 22 42.4 |
| 6 | 11 44 17.50 | 5.860 | 2 52 19.8 | 38.43 | 22 40.8 |
| 7 | 11 46 38.13 | 5.859 | 2 36 56.8 | 38.47 | 22 39.2 |
| 8 | 11 48 58.75 | 5.859 | 2 21 33.0 | 38.51 | 22 37.6 |
| 9 | 11 51 19.36 | 5.858 | 2 6 8.3 | 38.54 | 22 36.0 |
| 10 | 11 53 39.96 | 5.858 | 1 50 42.9 | 38.57 | 22 34.4 |
| 11 | 11 56 0.57 | 5.859 | 1 35 16.8 | 38.60 | 22 32.8 |
| 12 | 11 58 21.18 | 5.859 | 1 19 50.2 | 38.62 | 22 31.2 |
| 13 | 12 0 41.81 | 5.860 | 1 4 23.1 | 38.64 | 22 29.6 |
| 14 | 12 3 2.45 | 5.861 | 0 48 55.7 | 38.65 | 22 28.0 |
| 15 | 12 5 23.12 | 5.862 | 0 33 28.0 | 38.66 | 22 26.4 |
| 16 | 12 7 43.81 | 5.863 | 0 18 0.2 | 38.66 | 22 24.8 |
| 17 | 12 10 4.54 | 5.865 | +0 2 32.3 | 38.66 | 22 23.2 |
| 18 | 12 12 25.30 | 5.866 | −0 12 55.5 | 38.65 | 22 21.6 |
| 19 | 12 14 46.10 | 5.868 | 0 28 23.1 | 38.65 | 22 20.1 |
| 20 | 12 17 6.95 | 5.870 | 0 43 50.5 | 38.63 | 22 18.5 |
| 21 | 12 19 27.85 | 5.872 | 0 59 17.6 | 38.61 | 22 16.9 |
| 22 | 12 21 48.80 | 5.874 | 1 14 44.2 | 38.59 | 22 15.3 |
| 23 | 12 24 9.81 | 5.876 | 1 30 10.2 | 38.57 | 22 13.7 |
| 24 | 12 26 30.89 | 5.879 | 1 45 35.5 | 38.54 | 22 12.1 |
| 25 | 12 28 52.04 | 5.883 | 2 1 0.1 | 38.51 | 22 10.5 |
| 26 | 12 31 13.28 | 5.886 | 2 16 23.8 | 38.47 | 22 9.0 |
| 27 | 12 33 34.60 | 5.890 | 2 31 46.7 | 38.43 | 22 7.4 |
| 28 | 12 35 56.00 | 5.894 | 2 47 8.5 | 38.38 | 22 5.8 |
| 29 | 12 38 17.51 | 5.898 | 3 2 29.2 | 38.33 | 22 4.2 |
| 30 | 12 40 39.12 | 5.903 | 3 17 48.7 | 38.28 | 22 2.6 |
| 31 | 12 43 0.85 | 5.908 | 3 33 6.9 | 38.23 | 22 1.1 |
| 32 | 12 45 22.70 | +5.912 | −3 48 23.9 | −38.17 | 21 59.5 |

| Day of the Month. | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. |
|---|---|---|---|---|---|---|
| Semidiameter | 1″.9 | 2″.0 | 2″.0 | 2″.0 | 2″.0 | 2″.0 |
| Hor. Parallax | 3.4 | 3.4 | 3.4 | 3.5 | 3.5 | 3.5 |

NOTE.—North declinations are marked +, south declinations

## GREENWICH MEAN TIME.

### NOVEMBER.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 12 45 22.70 | +5.912 | − 3 48 23.9 | −38.17 | 21 59.5 |
| 2 | 12 47 44.67 | 5.918 | 4 3 39.4 | 38.11 | 21 57.9 |
| 3 | 12 50 6.77 | 5.924 | 4 18 53.3 | 38.04 | 21 56.3 |
| 4 | 12 52 29.02 | 5.930 | 4 34 5.6 | 37.98 | 21 54.7 |
| 5 | 12 54 51.42 | 5.937 | 4 49 16.4 | 37.91 | 21 53.2 |
| 6 | 12 57 13.97 | 5.943 | 5 4 25.3 | 37.84 | 21 51.6 |
| 7 | 12 59 36.68 | 5.950 | 5 19 32.4 | 37.76 | 21 50.1 |
| 8 | 13 1 59.56 | 5.957 | 5 34 37.5 | 37.67 | 21 48.5 |
| 9 | 13 4 22.61 | 5.965 | 5 49 40.5 | 37.58 | 21 47.0 |
| 10 | 13 6 45.84 | 5.972 | 6 4 41.3 | 37.49 | 21 45.4 |
| 11 | 13 9 9.25 | 5.979 | 6 19 39.8 | 37.39 | 21 43.9 |
| 12 | 13 11 32.85 | 5.986 | 6 34 35.9 | 37.28 | 21 42.3 |
| 13 | 13 13 56.63 | 5.994 | 6 49 29.5 | 37.17 | 21 40.8 |
| 14 | 13 16 20.60 | 6.002 | 7 4 20.4 | 37.06 | 21 39.2 |
| 15 | 13 18 44.76 | 6.011 | 7 19 8.6 | 36.95 | 21 37.7 |
| 16 | 13 21 9.12 | 6.019 | 7 33 53.9 | 36.83 | 21 36.2 |
| 17 | 13 23 33.69 | 6.027 | 7 48 36.3 | 36.70 | 21 34.6 |
| 18 | 13 25 58.46 | 6.036 | 8 3 15.6 | 36.57 | 21 33.1 |
| 19 | 13 28 23.44 | 6.045 | 8 17 51.7 | 36.44 | 21 31.6 |
| 20 | 13 30 48.64 | 6.054 | 8 32 24.6 | 36.30 | 21 30.1 |
| 21 | 13 33 14.05 | 6.063 | 8 46 54.1 | 36.15 | 21 28.6 |
| 22 | 13 35 39.69 | 6.073 | 9 1 20.1 | 36.00 | 21 27.1 |
| 23 | 13 38 5.55 | 6.082 | 9 15 42.5 | 35.85 | 21 25.5 |
| 24 | 13 40 31.64 | 6.092 | 9 30 1.2 | 35.70 | 21 24.0 |
| 25 | 13 42 57.97 | 6.102 | 9 44 16.2 | 35.54 | 21 22.5 |
| 26 | 13 45 24.54 | 6.113 | 9 58 27.3 | 35.38 | 21 21.0 |
| 27 | 13 47 51.36 | 6.123 | 10 12 34.6 | 35.22 | 21 19.6 |
| 28 | 13 50 18.44 | 6.134 | 10 26 37.8 | 35.05 | 21 18.1 |
| 29 | 13 52 45.79 | 6.145 | 10 40 36.8 | 34.87 | 21 16.6 |
| 30 | 13 55 13.40 | 6.156 | 10 54 31.5 | 34.69 | 21 15.1 |
| 31 | 13 57 41.26 | 6.168 | 11 8 21.9 | 34.51 | 21 13.6 |
| 32 | 14 0 9.41 | +6.179 | −11 22 8.0 | −34.32 | 21 12.2 |

| Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. |
|---|---|---|---|---|---|---|
| Semidiameter | 2″.0 | 2″.1 | 2″.1 | 2″.1 | 2″.1 | 2″.2 |
| Hor. Parallax | 3.6 | 3.6 | 3.7 | 3.7 | 3.8 | 3.8 |

### DECEMBER.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 13 57 41.26 | +6.168 | −11 8 21.9 | −34.51 | 21 13.6 |
| 2 | 14 0 9.41 | 6.179 | 11 22 8.0 | 34.32 | 21 12.2 |
| 3 | 14 2 37.85 | 6.191 | 11 35 49.6 | 34.13 | 21 10.7 |
| 4 | 14 5 6.58 | 6.203 | 11 49 26.6 | 33.94 | 21 9.2 |
| 5 | 14 7 35.60 | 6.215 | 12 2 58.9 | 33.74 | 21 7.8 |
| 6 | 14 10 4.91 | 6.227 | 12 16 26.4 | 33.54 | 21 6.4 |
| 7 | 14 12 34.52 | 6.240 | 12 29 49.0 | 33.33 | 21 4.9 |
| 8 | 14 15 4.44 | 6.252 | 12 43 6.5 | 33.12 | 21 3.5 |
| 9 | 14 17 34.66 | 6.265 | 12 56 18.9 | 32.90 | 21 2.0 |
| 10 | 14 20 5.19 | 6.278 | 13 9 26.0 | 32.68 | 21 0.6 |
| 11 | 14 22 36.03 | 6.291 | 13 22 27.8 | 32.45 | 20 59.2 |
| 12 | 14 25 7.17 | 6.304 | 13 35 24.2 | 32.22 | 20 57.8 |
| 13 | 14 27 38.63 | 6.317 | 13 48 15.0 | 31.99 | 20 56.4 |
| 14 | 14 30 10.40 | 6.330 | 14 1 0.1 | 31.75 | 20 55.0 |
| 15 | 14 32 42.47 | 6.343 | 14 13 39.3 | 31.50 | 20 53.6 |
| 16 | 14 35 14.85 | 6.356 | 14 26 12.5 | 31.25 | 20 52.2 |
| 17 | 14 37 47.55 | 6.369 | 14 38 39.7 | 31.00 | 20 50.8 |
| 18 | 14 40 20.57 | 6.382 | 14 51 0.7 | 30.74 | 20 49.4 |
| 19 | 14 42 53.90 | 6.395 | 15 3 15.4 | 30.48 | 20 48.0 |
| 20 | 14 45 27.55 | 6.409 | 15 15 23.8 | 30.22 | 20 46.6 |
| 21 | 14 48 1.52 | 6.422 | 15 27 25.8 | 29.95 | 20 45.3 |
| 22 | 14 50 35.81 | 6.435 | 15 39 21.2 | 29.67 | 20 43.9 |
| 23 | 14 53 10.42 | 6.449 | 15 51 10.0 | 29.39 | 20 42.5 |
| 24 | 14 55 45.36 | 6.462 | 16 2 52.0 | 29.11 | 20 41.2 |
| 25 | 14 58 20.61 | 6.476 | 16 14 27.2 | 28.82 | 20 39.8 |
| 26 | 15 0 56.19 | 6.489 | 16 25 55.4 | 28.53 | 20 38.5 |
| 27 | 15 3 32.10 | 6.503 | 16 37 16.7 | 28.23 | 20 37.1 |
| 28 | 15 6 8.34 | 6.517 | 16 48 30.9 | 27.93 | 20 35.8 |
| 29 | 15 8 44.92 | 6.531 | 16 59 37.8 | 27.63 | 20 34.5 |
| 30 | 15 11 21.84 | 6.545 | 17 10 37.4 | 27.33 | 20 33.2 |
| 31 | 15 13 59.09 | 6.560 | 17 21 29.7 | 27.02 | 20 31.9 |
| 32 | 15 16 36.70 | +6.575 | −17 32 14.5 | −26.70 | 20 30.6 |

| Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. | 31st. |
|---|---|---|---|---|---|---|---|
| Semidiameter | 2″.2 | 2″.2 | 2″.3 | 2″.3 | 2″.4 | 2″.4 | 2″.5 |
| Hor. Parallax | 3.9 | 3.9 | 4.0 | 4.0 | 4.1 | 4.2 | 4.3 |

**+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.**

## GREENWICH MEAN TIME.

### JANUARY.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 15 27 49.13 | +1.864 | −17 54 19.8 | −6.61 | 20 43.1 |
| 2 | 15 28 33.73 | 1.851 | 17 56 57.3 | 6.53 | 20 39.9 |
| 3 | 15 29 18.82 | 1.838 | 17 59 32.9 | 6.44 | 20 36.7 |
| 4 | 15 30 1.98 | 1.824 | 18 2 6.3 | 6.36 | 20 33.5 |
| 5 | 15 30 45.60 | 1.810 | 18 4 37.8 | 6.28 | 20 30.3 |
| 6 | 15 31 28.88 | 1.796 | 18 7 7.3 | 6.19 | 20 27.1 |
| 7 | 15 32 11.81 | 1.781 | 18 9 34.8 | 6.11 | 20 23.9 |
| 8 | 15 32 54.39 | 1.766 | 18 12 0.3 | 6.02 | 20 20.7 |
| 9 | 15 33 36.61 | 1.751 | 18 14 23.7 | 5.94 | 20 17.5 |
| 10 | 15 34 18.46 | 1.736 | 18 16 45.1 | 5.86 | 20 14.2 |
| 11 | 15 34 59.93 | 1.720 | 18 19 4.5 | 5.77 | 20 10.9 |
| 12 | 15 35 41.01 | 1.704 | 18 21 21.9 | 5.69 | 20 7.6 |
| 13 | 15 36 21.71 | 1.688 | 18 23 37.1 | 5.60 | 20 4.4 |
| 14 | 15 37 2.01 | 1.671 | 18 25 50.3 | 5.51 | 20 1.1 |
| 15 | 15 37 41.92 | 1.654 | 18 28 1.3 | 5.42 | 19 57.8 |
| 16 | 15 38 21.41 | 1.637 | 18 30 10.4 | 5.33 | 19 54.5 |
| 17 | 15 39 0.48 | 1.619 | 18 32 17.3 | 5.25 | 19 51.2 |
| 18 | 15 39 39.12 | 1.601 | 18 34 22.2 | 5.16 | 19 47.9 |
| 19 | 15 40 17.32 | 1.583 | 18 36 24.8 | 5.07 | 19 44.6 |
| 20 | 15 40 55.08 | 1.564 | 18 38 25.4 | 4.98 | 19 41.3 |
| 21 | 15 41 32.39 | 1.545 | 18 40 23.8 | 4.89 | 19 38.0 |
| 22 | 15 42 9.24 | 1.525 | 18 42 20.2 | 4.80 | 19 34.7 |
| 23 | 15 42 45.61 | 1.505 | 18 44 14.4 | 4.71 | 19 31.4 |
| 24 | 15 43 21.50 | 1.485 | 18 46 6.5 | 4.62 | 19 28.1 |
| 25 | 15 43 56.90 | 1.465 | 18 47 56.3 | 4.53 | 19 24.7 |
| 26 | 15 44 31.81 | 1.444 | 18 49 44.0 | 4.44 | 19 21.3 |
| 27 | 15 45 6.22 | 1.423 | 18 51 29.5 | 4.35 | 19 17.9 |
| 28 | 15 45 40.12 | 1.401 | 18 53 12.9 | 4.26 | 19 14.5 |
| 29 | 15 46 13.49 | 1.379 | 18 54 54.0 | 4.17 | 19 11.1 |
| 30 | 15 46 46.33 | 1.357 | 18 56 33.0 | 4.08 | 19 7.7 |
| 31 | 15 47 18.65 | 1.335 | 18 58 9.7 | 3.99 | 19 4.3 |
| 32 | 15 47 50.42 | +1.312 | −18 59 44.3 | −3.90 | 19 0.9 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Polar Semidiameter | 15″.6 | 15″.9 | 16″.3 | 16″.7 |
| Horizontal Parallax | 1.5 | 1.5 | 1.5 | 1.6 |

### FEBRUARY.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 15 47 50.42 | +1.312 | −18 59 44.3 | −3.90 | 19 0.9 |
| 2 | 15 48 21.64 | 1.289 | 19 1 16.8 | 3.81 | 18 57.5 |
| 3 | 15 48 52.30 | 1.266 | 19 2 47.1 | 3.72 | 18 54.0 |
| 4 | 15 49 22.40 | 1.242 | 19 4 15.0 | 3.63 | 18 50.5 |
| 5 | 15 49 51.92 | 1.218 | 19 5 40.9 | 3.53 | 18 47.0 |
| 6 | 15 50 20.87 | 1.194 | 19 7 4.5 | 3.44 | 18 43.6 |
| 7 | 15 50 49.24 | 1.170 | 19 8 26.1 | 3.35 | 18 40.2 |
| 8 | 15 51 17.02 | 1.145 | 19 9 45.5 | 3.26 | 18 36.7 |
| 9 | 15 51 44.20 | 1.120 | 19 11 2.7 | 3.17 | 18 33.2 |
| 10 | 15 52 10.78 | 1.095 | 19 12 17.6 | 3.07 | 18 29.7 |
| 11 | 15 52 36.75 | 1.069 | 19 13 30.4 | 2.98 | 18 26.2 |
| 12 | 15 53 2.11 | 1.043 | 19 14 41.0 | 2.89 | 18 22.7 |
| 13 | 15 53 26.84 | 1.017 | 19 15 49.5 | 2.80 | 18 19.2 |
| 14 | 15 53 50.93 | 0.990 | 19 16 55.6 | 2.71 | 18 15.7 |
| 15 | 15 54 14.38 | 0.963 | 19 17 59.6 | 2.62 | 18 12.2 |
| 16 | 15 54 37.17 | 0.936 | 19 19 1.5 | 2.53 | 18 8.6 |
| 17 | 15 54 59.31 | 0.909 | 19 20 1.1 | 2.44 | 18 5.0 |
| 18 | 15 55 20.79 | 0.881 | 19 20 58.5 | 2.35 | 18 1.4 |
| 19 | 15 55 41.59 | 0.853 | 19 21 53.6 | 2.26 | 17 57.8 |
| 20 | 15 56 1.72 | 0.825 | 19 22 46.6 | 2.16 | 17 54.2 |
| 21 | 15 56 21.17 | 0.796 | 19 23 37.3 | 2.07 | 17 50.6 |
| 22 | 15 56 39.92 | 0.767 | 19 24 25.7 | 1.97 | 17 47.0 |
| 23 | 15 56 57.97 | 0.738 | 19 25 12.0 | 1.88 | 17 43.4 |
| 24 | 15 57 15.30 | 0.708 | 19 25 56.1 | 1.78 | 17 39.7 |
| 25 | 15 57 31.93 | 0.678 | 19 26 37.9 | 1.69 | 17 36.0 |
| 26 | 15 57 47.84 | 0.648 | 19 27 17.4 | 1.60 | 17 32.3 |
| 27 | 15 58 3.03 | 0.618 | 19 27 54.8 | 1.50 | 17 28.6 |
| 28 | 15 58 17.49 | 0.588 | 19 28 29.9 | 1.41 | 17 24.9 |
| 29 | 15 58 31.22 | 0.557 | 19 29 2.9 | 1.32 | 17 21.2 |
| 30 | 15 58 44.21 | 0.526 | 19 29 33.5 | 1.23 | 17 17.5 |
| 31 | 15 58 56.46 | 0.495 | 19 30 2.0 | 1.14 | 17 13.8 |
| 32 | 15 59 7.97 | +0.464 | −19 30 28.4 | −1.05 | 17 10.1 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Semidiameter | 16″.8 | 17″.3 | 17″.8 | 18″.4 |
| Horizontal Parallax | 1.6 | 1.6 | 1.7 | 1.7 |

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

### MARCH.

| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
|---|---|---|---|---|---|
| | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 15 58 44.21 | +0.526 | −19 29 33.5 | −1.23 | 17 17.5 |
| 2 | 15 58 56.46 | 0.495 | 19 30 2.0 | 1.14 | 17 13.8 |
| 3 | 15 59 7.97 | 0.464 | 19 30 28.4 | 1.05 | 17 10.1 |
| 4 | 15 59 18.73 | 0.433 | 19 30 52.5 | 0.96 | 17 6.3 |
| 5 | 15 59 28.74 | 0.401 | 19 31 14.3 | 0.87 | 17 2.5 |
| 6 | 15 59 37.99 | 0.369 | 19 31 34.0 | 0.78 | 16 58.7 |
| 7 | 15 59 46.47 | 0.338 | 19 31 51.6 | 0.69 | 16 54.9 |
| 8 | 15 59 54.20 | 0.306 | 19 32 7.0 | 0.60 | 16 51.1 |
| 9 | 16 0 1.16 | 0.274 | 19 32 20.1 | 0.50 | 16 47.3 |
| 10 | 16 0 7.37 | 0.242 | 19 32 31.1 | 0.41 | 16 43.5 |
| 11 | 16 0 12.80 | 0.210 | 19 32 39.8 | 0.32 | 16 39.6 |
| 12 | 16 0 17.47 | 0.178 | 19 32 46.3 | 0.23 | 16 35.7 |
| 13 | 16 0 21.36 | 0.146 | 19 32 50.6 | 0.15 | 16 31.8 |
| 14 | 16 0 24.48 | 0.114 | 19 32 52.8 | −0.05 | 16 27.9 |
| 15 | 16 0 26.81 | 0.082 | 19 32 52.8 | +0.05 | 16 24.0 |
| 16 | 16 0 28.37 | 0.049 | 19 32 50.6 | 0.14 | 16 20.1 |
| 17 | 16 0 29.14 | +0.017 | 19 32 46.2 | 0.23 | 16 16.2 |
| 18 | 16 0 29.13 | −0.016 | 19 32 39.6 | 0.32 | 16 12.3 |
| 19 | 16 0 28.33 | 0.049 | 19 32 30.8 | 0.41 | 16 8.4 |
| 20 | 16 0 26.75 | 0.082 | 19 32 19.8 | 0.50 | 16 4.4 |
| 21 | 16 0 24.38 | 0.115 | 19 32 6.6 | 0.59 | 16 0.4 |
| 22 | 16 0 21.23 | 0.148 | 19 31 51.3 | 0.68 | 15 56.4 |
| 23 | 16 0 17.29 | 0.181 | 19 31 33.8 | 0.77 | 15 52.4 |
| 24 | 16 0 12.57 | 0.214 | 19 31 14.1 | 0.86 | 15 48.4 |
| 25 | 16 0 7.07 | 0.246 | 19 30 52.3 | 0.95 | 15 44.4 |
| 26 | 16 0 0.78 | 0.278 | 19 30 28.2 | 1.04 | 15 40.4 |
| 27 | 15 59 53.72 | 0.310 | 19 30 2.2 | 1.13 | 15 36.3 |
| 28 | 15 59 45.89 | 0.342 | 19 29 34.0 | 1.22 | 15 32.2 |
| 29 | 15 59 37.31 | 0.374 | 19 29 3.7 | 1.31 | 15 28.1 |
| 30 | 15 59 27.96 | 0.405 | 19 28 31.2 | 1.40 | 15 24.0 |
| 31 | 15 59 17.86 | 0.436 | 19 27 56.7 | 1.48 | 15 19.9 |
| 32 | 15 59 7.01 | −0.467 | −19 27 20.1 | +1.57 | 15 15.8 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Semidiameter | 18″.3 | 18″.9 | 19″.5 | 20″.1 |
| Horizontal Parallax | 1.7 | 1.8 | 1.8 | 1.9 |

### APRIL.

| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
|---|---|---|---|---|---|
| | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 15 59 7.01 | −0.467 | −19 27 20.1 | +1.57 | 15 15.8 |
| 2 | 15 58 55.43 | 0.498 | 19 26 41.5 | 1.65 | 15 11.7 |
| 3 | 15 58 43.11 | 0.528 | 19 26 0.8 | 1.73 | 15 7.6 |
| 4 | 15 58 30.06 | 0.558 | 19 25 17.1 | 1.82 | 15 3.4 |
| 5 | 15 58 16.30 | 0.588 | 19 24 33.6 | 1.90 | 14 59.2 |
| 6 | 15 58 1.83 | 0.617 | 19 23 47.1 | 1.99 | 14 55.0 |
| 7 | 15 57 46.66 | 0.646 | 19 22 58.5 | 2.07 | 14 50.8 |
| 8 | 15 57 30.80 | 0.675 | 19 22 7.9 | 2.15 | 14 46.6 |
| 9 | 15 57 14.24 | 0.704 | 19 21 15.4 | 2.23 | 14 42.4 |
| 10 | 15 56 57.01 | 0.732 | 19 20 21.0 | 2.31 | 14 38.2 |
| 11 | 15 56 39.12 | 0.759 | 19 19 24.7 | 2.39 | 14 34.0 |
| 12 | 15 56 20.57 | 0.786 | 19 18 26.4 | 2.47 | 14 29.8 |
| 13 | 15 56 1.38 | 0.813 | 19 17 26.3 | 2.54 | 14 25.5 |
| 14 | 15 55 41.54 | 0.839 | 19 16 24.4 | 2.62 | 14 21.2 |
| 15 | 15 55 21.08 | 0.865 | 19 15 20.7 | 2.69 | 14 16.9 |
| 16 | 15 55 0.01 | 0.890 | 19 14 15.2 | 2.77 | 14 12.6 |
| 17 | 15 54 38.35 | 0.914 | 19 13 7.8 | 2.84 | 14 8.3 |
| 18 | 15 54 16.09 | 0.938 | 19 11 58.8 | 2.91 | 14 4.0 |
| 19 | 15 53 53.25 | 0.962 | 19 10 48.1 | 2.98 | 13 59.7 |
| 20 | 15 53 29.86 | 0.986 | 19 9 35.7 | 3.05 | 13 55.4 |
| 21 | 15 53 5.93 | 1.009 | 19 8 21.6 | 3.12 | 13 51.1 |
| 22 | 15 52 41.46 | 1.031 | 19 7 6.0 | 3.18 | 13 46.7 |
| 23 | 15 52 16.48 | 1.052 | 19 5 48.8 | 3.25 | 13 42.4 |
| 24 | 15 51 51.00 | 1.072 | 19 4 30.0 | 3.31 | 13 38.1 |
| 25 | 15 51 25.05 | 1.091 | 19 3 9.8 | 3.37 | 13 33.8 |
| 26 | 15 50 58.63 | 1.110 | 19 1 48.2 | 3.43 | 13 29.2 |
| 27 | 15 50 31.78 | 1.128 | 19 0 25.2 | 3.49 | 13 24.8 |
| 28 | 15 50 4.52 | 1.145 | 18 59 0.8 | 3.54 | 13 20.4 |
| 29 | 15 49 36.85 | 1.161 | 18 57 35.2 | 3.59 | 13 16.0 |
| 30 | 15 49 8.80 | 1.176 | 18 56 8.5 | 3.64 | 13 11.6 |
| 31 | 15 48 40.38 | 1.191 | 18 54 40.5 | 3.69 | 13 7.2 |
| 32 | 15 48 11.63 | −1.205 | −18 53 11.5 | +3.73 | 13 2.8 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Semidiameter | 20″.1 | 20″.6 | 21″.0 | 21″.3 |
| Horizontal Parallax | 1.9 | 1.9 | 2.0 | 2.0 |

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing: — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

| MAY. | | | | | | JUNE. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
| | *Noon.* | *Noon.* | *Noon.* | *Noon.* | | | *Noon.* | *Noon.* | *Noon.* | *Noon.* | |
| | h m s | s | ° ′ ″ | ″ | h m | | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 15 48 40.38 | −1.191 | −18 54 40.5 | +3.69 | 13 7.2 | 1 | 15 32 52.37 | −1.213 | −18 5 4.5 | +3.84 | 10 49.6 |
| 2 | 15 48 11.63 | 1.205 | 18 53 11.5 | 3.73 | 13 2.8 | 2 | 15 32 23.38 | 1.200 | 18 3 32.9 | 3.80 | 10 45.2 |
| 3 | 15 47 42.55 | 1.218 | 18 51 41.4 | 3.77 | 12 58.4 | 3 | 15 31 54.73 | 1.186 | 18 2 2.3 | 3.76 | 10 40.8 |
| 4 | 15 47 13.17 | 1.230 | 18 50 10.3 | 3.81 | 12 54.0 | 4 | 15 31 26.44 | 1.171 | 18 0 32.7 | 3.71 | 10 36.4 |
| 5 | 15 46 43.51 | 1.241 | 18 48 38.2 | 3.85 | 12 49.6 | 5 | 15 30 58.51 | 1.156 | 17 59 4.3 | 3.66 | 10 32.0 |
| 6 | 15 46 13.58 | 1.252 | 18 47 5.3 | 3.89 | 12 45.2 | 6 | 15 30 30.95 | 1.140 | 17 57 37.3 | 3.60 | 10 27.6 |
| 7 | 15 45 43.42 | 1.262 | 18 45 31.5 | 3.92 | 12 40.8 | 7 | 15 30 3.77 | 1.123 | 17 56 11.6 | 3.54 | 10 23.2 |
| 8 | 15 45 13.04 | 1.271 | 18 43 56.9 | 3.95 | 12 36.3 | 8 | 15 29 37.03 | 1.106 | 17 54 47.4 | 3.48 | 10 18.8 |
| 9 | 15 44 42.46 | 1.278 | 18 42 21.5 | 3.98 | 12 31.9 | 9 | 15 29 10.71 | 1.088 | 17 53 24.6 | 3.42 | 10 14.4 |
| 10 | 15 44 11.71 | 1.285 | 18 40 45.5 | 4.01 | 12 27.4 | 10 | 15 28 44.83 | 1.069 | 17 52 3.4 | 3.35 | 10 10.1 |
| 11 | 15 43 40.78 | 1.291 | 18 39 8.9 | 4.03 | 12 23.0 | 11 | 15 28 19.42 | 1.050 | 17 50 43.9 | 3.28 | 10 5.8 |
| 12 | 15 43 9.72 | 1.297 | 18 37 31.8 | 4.05 | 12 18.5 | 12 | 15 27 54.48 | 1.030 | 17 49 25.9 | 3.21 | 10 1.5 |
| 13 | 15 42 38.53 | 1.302 | 18 35 54.2 | 4.07 | 12 14.1 | 13 | 15 27 30.03 | 1.009 | 17 48 9.6 | 3.14 | 9 57.1 |
| 14 | 15 42 7.34 | 1.306 | 18 34 16.2 | 4.09 | 12 9.6 | 14 | 15 27 6.09 | 0.987 | 17 46 55.1 | 3.06 | 9 52.8 |
| 15 | 15 41 35.87 | 1.309 | 18 32 37.8 | 4.11 | 12 5.2 | 15 | 15 26 42.66 | 0.965 | 17 45 42.6 | 2.98 | 9 48.5 |
| 16 | 15 41 4.44 | 1.310 | 18 30 59.1 | 4.12 | 12 0.7 | 16 | 15 26 19.77 | 0.942 | 17 44 31.9 | 2.90 | 9 44.2 |
| 17 | 15 40 33.00 | 1.311 | 18 29 20.3 | 4.13 | 11 56.3 | 17 | 15 25 57.42 | 0.919 | 17 43 23.2 | 2.82 | 9 39.9 |
| 18 | 15 40 1.54 | 1.311 | 18 27 41.3 | 4.13 | 11 51.8 | 18 | 15 25 35.64 | 0.895 | 17 42 16.5 | 2.74 | 9 35.6 |
| 19 | 15 39 30.09 | 1.310 | 18 26 2.2 | 4.13 | 11 47.4 | 19 | 15 25 14.43 | 0.871 | 17 41 11.9 | 2.65 | 9 31.3 |
| 20 | 15 38 58.67 | 1.308 | 18 24 23.2 | 4.12 | 11 42.9 | 20 | 15 24 53.80 | 0.847 | 17 40 9.4 | 2.56 | 9 27.0 |
| 21 | 15 38 27.30 | 1.305 | 18 22 44.2 | 4.11 | 11 38.5 | 21 | 15 24 33.78 | 0.822 | 17 39 9.1 | 2.47 | 9 22.7 |
| 22 | 15 37 56.01 | 1.301 | 18 21 5.4 | 4.10 | 11 34.0 | 22 | 15 24 14.37 | 0.796 | 17 38 11.2 | 2.37 | 9 18.5 |
| 23 | 15 37 24.83 | 1.296 | 18 19 26.9 | 4.09 | 11 29.6 | 23 | 15 23 55.58 | 0.770 | 17 37 15.6 | 2.27 | 9 14.3 |
| 24 | 15 36 53.77 | 1.290 | 18 17 48.7 | 4.08 | 11 25.1 | 24 | 15 23 37.42 | 0.743 | 17 36 22.3 | 2.17 | 9 10.1 |
| 25 | 15 36 22.85 | 1.284 | 18 16 10.9 | 4.06 | 11 20.7 | 25 | 15 23 19.90 | 6.716 | 17 35 31.4 | 2.07 | 9 5.9 |
| 26 | 15 35 52.09 | 1.277 | 18 14 33.6 | 4.04 | 11 16.2 | 26 | 15 23 3.04 | 0.689 | 17 34 42.9 | 1.97 | 9 1.7 |
| 27 | 15 35 21.54 | 1.269 | 18 12 56.9 | 4.01 | 11 11.8 | 27 | 15 22 46.84 | 0.661 | 17 33 57.0 | 1.87 | 8 57.5 |
| 28 | 15 34 51.20 | 1.260 | 18 11 20.9 | 3.98 | 11 7.3 | 28 | 15 22 31.31 | 0.633 | 17 33 13.4 | 1.76 | 8 53.3 |
| 29 | 15 34 21.10 | 1.250 | 18 9 45.5 | 3.95 | 11 2.9 | 29 | 15 22 16.46 | 0.605 | 17 32 32.5 | 1.65 | 8 49.1 |
| 30 | 15 33 51.24 | 1.239 | 18 8 10.9 | 3.92 | 10 58.4 | 30 | 15 22 2.29 | 0.576 | 17 31 54.2 | 1.55 | 8 44.9 |
| 31 | 15 33 21.66 | 1.226 | 18 6 37.2 | 3.88 | 10 54.0 | 31 | 15 21 48.82 | 0.547 | 17 31 18.3 | 1.44 | 8 40.7 |
| 32 | 15 32 52.37 | −1.213 | −18 5 4.5 | +3.84 | 10 49.6 | 32 | 15 21 36.03 | −0.518 | −17 30 45.0 | +1.33 | 8 36.6 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. | Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|---|---|---|---|---|
| Semidiameter | 21″.3 | 21″.5 | 21″.5 | 21″.4 | Semidiameter | 21″.4 | 21″.2 | 20″.8 | 20″.3 |
| Horizontal Parallax | 2.0 | 2.0 | 2.0 | 2.0 | Horizontal Parallax | 2.0 | 2.0 | 2.0 | 1.9 |

**Note.**—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

| JULY. | | | | | | AUGUST. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ′ ″ | ″ | h m | | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 15 21 48.82 | −0.547 | −17 31 18.3 | +1.44 | 8 40.7 | 1 | 15 20 48.94 | +0.392 | −17 35 22.5 | −2.10 | 6 38.0 |
| 2 | 15 21 36.03 | 0.518 | 17 30 45.0 | 1.33 | 8 36.6 | 2 | 15 20 58.71 | 0.422 | 17 36 14.1 | 2.21 | 6 34.2 |
| 3 | 15 21 23.94 | 0.489 | 17 30 14.5 | 1.22 | 8 32.5 | 3 | 15 21 9.18 | 0.451 | 17 37 8.3 | 2.31 | 6 30.4 |
| 4 | 15 21 12.55 | 0.460 | 17 29 46.5 | 1.11 | 8 28.4 | 4 | 15 21 20.35 | 0.480 | 17 38 5.1 | 2.41 | 6 26.7 |
| 5 | 15 21 1.86 | 0.431 | 17 29 21.2 | 1.00 | 8 24.3 | 5 | 15 21 32.22 | 0.509 | 17 39 4.4 | 2.51 | 6 23.0 |
| 6 | 15 20 51.88 | 0.401 | 17 28 58.6 | 0.89 | 8 20.2 | 6 | 15 21 44.78 | 0.538 | 17 40 6.3 | 2.61 | 6 19.3 |
| 7 | 15 20 42.62 | 0.371 | 17 28 38.7 | 0.78 | 8 16.1 | 7 | 15 21 58.03 | 0.567 | 17 41 10.7 | 2.72 | 6 15.6 |
| 8 | 15 20 34.08 | 0.341 | 17 28 21.6 | 0.67 | 8 12.0 | 8 | 15 22 11.98 | 0.596 | 17 42 17.5 | 2.83 | 6 11.9 |
| 9 | 15 20 26.26 | 0.311 | 17 28 7.1 | 0.55 | 8 7.9 | 9 | 15 22 26.62 | 0.625 | 17 43 26.7 | 2.93 | 6 8.2 |
| 10 | 15 20 19.15 | 0.281 | 17 27 55.4 | 0.44 | 8 3.8 | 10 | 15 22 41.96 | 0.653 | 17 44 38.2 | 3.03 | 6 4.5 |
| 11 | 15 20 12.78 | 0.251 | 17 27 46.5 | 0.32 | 7 59.8 | 11 | 15 22 57.97 | 0.681 | 17 45 52.1 | 3.13 | 6 0.8 |
| 12 | 15 20 7.13 | 0.221 | 17 27 40.3 | 0.20 | 7 55.8 | 12 | 15 23 14.64 | 0.709 | 17 47 8.3 | 3.23 | 5 57.2 |
| 13 | 15 20 2.21 | 0.190 | 17 27 36.9 | +0.09 | 7 51.8 | 13 | 15 23 31.99 | 0.737 | 17 48 26.9 | 3.32 | 5 53.6 |
| 14 | 15 19 58.02 | 0.159 | 17 27 36.3 | −0.03 | 7 47.8 | 14 | 15 23 50.00 | 6.764 | 17 49 47.7 | 3.42 | 5 50.0 |
| 15 | 15 19 54.58 | 0.128 | 17 27 38.5 | 0.14 | 7 43.8 | 15 | 15 24 8.68 | 0.792 | 17 51 10.8 | 3.51 | 5 46.4 |
| 16 | 15 19 51.86 | 0.098 | 17 27 43.5 | 0.26 | 7 39.8 | 16 | 15 24 28.02 | 0.819 | 17 52 36.1 | 3.60 | 5 42.8 |
| 17 | 15 19 49.88 | 0.067 | 17 27 51.3 | 0.38 | 7 35.8 | 17 | 15 24 48.01 | 0.846 | 17 54 3.6 | 3.69 | 5 39.2 |
| 18 | 15 19 48.64 | 0.036 | 17 28 1.9 | 0.50 | 7 31.9 | 18 | 15 25 8.65 | 0.873 | 17 55 33.2 | 3.78 | 5 35.6 |
| 19 | 15 19 48.15 | −0.005 | 17 28 15.3 | 0.62 | 7 28.0 | 19 | 15 25 29.94 | 0.900 | 17 57 5.1 | 3.87 | 5 32.0 |
| 20 | 15 19 48.40 | +0.026 | 17 28 31.6 | 0.74 | 7 24.1 | 20 | 15 25 51.87 | 0.927 | 17 58 38.9 | 3.96 | 5 28.4 |
| 21 | 15 19 49.39 | 0.057 | 17 28 50.7 | 0.86 | 7 20.2 | 21 | 15 26 14.43 | 0.953 | 18 0 14.9 | 4.05 | 5 24.8 |
| 22 | 15 19 51.13 | 0.088 | 17 29 12.6 | 0.98 | 7 16.3 | 22 | 15 26 37.63 | 0.979 | 18 1 52.9 | 4.13 | 5 21.2 |
| 23 | 15 19 53.61 | 0.119 | 17 29 37.3 | 1.09 | 7 12.4 | 23 | 15 27 1.46 | 1.005 | 18 3 32.9 | 4.21 | 5 17.7 |
| 24 | 15 19 56.83 | 0.150 | 17 30 4.8 | 1.20 | 7 8.5 | 24 | 15 27 25.90 | 1.031 | 18 5 14.8 | 4.29 | 5 14.2 |
| 25 | 15 20 0.79 | 0.180 | 17 30 35.0 | 1.32 | 7 4.6 | 25 | 15 27 50.96 | 1.056 | 18 6 58.6 | 4.37 | 5 10.7 |
| 26 | 15 20 5.48 | 0.211 | 17 31 8.0 | 1.44 | 7 0.8 | 26 | 15 28 16.62 | 1.081 | 18 8 44.1 | 4.45 | 5 7.2 |
| 27 | 15 20 10.90 | 0.242 | 17 31 43.7 | 1.55 | 6 57.0 | 27 | 15 28 42.88 | 1.106 | 18 10 31.5 | 4.52 | 5 3.7 |
| 28 | 15 20 17.05 | 0.272 | 17 32 22.1 | 1.66 | 6 53.2 | 28 | 15 29 9.73 | 1.131 | 18 12 20.7 | 4.59 | 5 0.2 |
| 29 | 15 20 23.94 | 0.302 | 17 33 3.1 | 1.77 | 6 49.4 | 29 | 15 29 37.18 | 1.155 | 18 14 11.6 | 4.66 | 4 56.7 |
| 30 | 15 20 31.56 | 0.332 | 17 33 46.9 | 1.88 | 6 45.6 | 30 | 15 30 5.20 | 1.179 | 18 16 4.2 | 4.73 | 4 53.2 |
| 31 | 15 20 39.89 | 0.362 | 17 34 33.4 | 1.99 | 6 41.8 | 31 | 15 30 33.79 | 1.203 | 18 17 58.5 | 4.80 | 4 49.8 |
| 32 | 15 20 48.94 | +0.392 | −17 35 22.5 | −2.10 | 6 38.0 | 32 | 15 31 2.96 | +1.227 | −18 19 54.3 | −4.86 | 4 46.3 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. | Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|---|---|---|---|---|
| Semidiameter | 20″.3 | 19″.8 | 19″.3 | 18″.8 | Semidiameter | 18″.7 | 18″.1 | 17″.6 | 17″.1 |
| Horizontal Parallax | 1.9 | 1.9 | 1.8 | 1.8 | Horizontal Parallax | 1.8 | 1.7 | 1.7 | 1.6 |

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

| SEPTEMBER. | | | | | | OCTOBER. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination | Var. of Dec. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
| | *Noon.* | *Noon.* | *Noon.* | *Noon.* | | | *Noon.* | *Noon.* | *Noon.* | *Noon.* | |
| | h m s | s | ° ′ ″ | ″ | h m | | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 15 31 2.96 | +1.227 | −18 19 54.3 | −4.86 | 4 46.3 | 1 | 15 49 35.94 | +1.829 | −19 27 4.9 | −6.09 | 3 7.0 |
| 2 | 15 31 32.69 | 1.250 | 18 21 51.7 | 4.92 | 4 42.9 | 2 | 15 50 20.03 | 1.845 | 19 29 31.2 | 6.10 | 3 3.8 |
| 3 | 15 32 2.97 | 1.273 | 18 23 50.6 | 4.98 | 4 39.5 | 3 | 15 51 4.51 | 1.861 | 19 31 57.8 | 6.11 | 3 0.6 |
| 4 | 15 32 33.81 | 1.296 | 18 25 51.1 | 5.04 | 4 36.1 | 4 | 15 51 49.37 | 1.877 | 19 34 24.7 | 6.12 | 2 57.4 |
| 5 | 15 33 5.19 | 1.319 | 18 27 53.0 | 5.10 | 4 32.7 | 5 | 15 52 34.60 | 1.893 | 19 36 51.9 | 6.13 | 2 54.2 |
| 6 | 15 33 37.11 | 1.341 | 18 29 56.3 | 5.16 | 4 29.3 | 6 | 15 53 20.21 | 1.908 | 19 39 19.4 | 6.14 | 2 51.0 |
| 7 | 15 34 9.58 | 1.363 | 18 32 0.9 | 5.22 | 4 25.9 | 7 | 15 54 6.18 | 1.923 | 19 41 47.1 | 6.15 | 2 47.8 |
| 8 | 15 34 42.59 | 1.385 | 18 34 7.0 | 5.28 | 4 22.5 | 8 | 15 54 52.51 | 1.938 | 19 44 14.8 | 6.16 | 2 44.6 |
| 9 | 15 35 16.12 | 1.407 | 18 36 14.3 | 5.33 | 4 19.1 | 9 | 15 55 39.21 | 1.953 | 19 46 42.7 | 6.16 | 2 41.5 |
| 10 | 15 35 50.17 | 1.429 | 18 38 22.8 | 5.38 | 4 15.7 | 10 | 15 56 26.27 | 1.967 | 19 49 10.8 | 6.17 | 2 38.4 |
| 11 | 15 36 24.73 | 1.451 | 18 40 32.6 | 5.43 | 4 12.3 | 11 | 15 57 13.68 | 1.981 | 19 51 39.0 | 6.17 | 2 35.2 |
| 12 | 15 36 59.80 | 1.472 | 18 42 43.6 | 5.48 | 4 9.0 | 12 | 15 58 1.43 | 1.995 | 19 54 7.2 | 6.17 | 2 32.0 |
| 13 | 15 37 35.38 | 1.493 | 18 44 55.7 | 5.53 | 4 5.7 | 13 | 15 58 49.52 | 2.009 | 19 56 35.4 | 6.17 | 2 28.9 |
| 14 | 15 38 11.46 | 1.514 | 18 47 9.0 | 5.58 | 4 2.4 | 14 | 15 59 37.94 | 2.023 | 19 59 3.5 | 6.17 | 2 25.8 |
| 15 | 15 38 48.03 | 1.535 | 18 49 23.3 | 5.62 | 3 59.1 | 15 | 16 0 26.69 | 2.037 | 20 1 31.6 | 6.16 | 2 22.7 |
| 16 | 15 39 25.10 | 1.555 | 18 51 38.7 | 5.66 | 3 55.8 | 16 | 16 1 15.76 | 2.050 | 20 3 59.6 | 6.16 | 2 19.6 |
| 17 | 15 40 2.66 | 1.575 | 18 53 55.1 | 5.70 | 3 52.5 | 17 | 16 2 5.14 | 2.063 | 20 6 27.5 | 6.16 | 2 16.5 |
| 18 | 15 40 40.70 | 1.595 | 18 56 12.4 | 5.74 | 3 49.2 | 18 | 16 2 54.84 | 2.076 | 20 8 55.1 | 6.15 | 2 13.4 |
| 19 | 15 41 19.21 | 1.615 | 18 58 30.6 | 5.78 | 3 45.9 | 19 | 16 3 44.83 | 2.089 | 20 11 22.5 | 6.14 | 2 10.3 |
| 20 | 15 41 58.19 | 1.634 | 19 0 49.7 | 5.82 | 3 42.6 | 20 | 16 4 35.12 | 2.101 | 20 13 49.8 | 6.13 | 2 7.2 |
| 21 | 15 42 37.63 | 1.653 | 19 3 9.6 | 5.85 | 3 39.3 | 21 | 16 5 25.70 | 2.113 | 20 16 16.8 | 6.12 | 2 4.1 |
| 22 | 15 43 17.52 | 1.671 | 19 5 30.3 | 5.88 | 3 36.0 | 22 | 16 6 16.56 | 2.125 | 20 18 43.4 | 6.10 | 2 1.0 |
| 23 | 15 43 57.86 | 1.689 | 19 7 51.8 | 5.91 | 3 32.7 | 23 | 16 7 7.70 | 2.137 | 20 21 9.6 | 6.09 | 1 57.9 |
| 24 | 15 44 38.65 | 1.707 | 19 10 14.0 | 5.94 | 3 29.5 | 24 | 16 7 59.12 | 2.148 | 20 23 35.5 | 6.07 | 1 54.8 |
| 25 | 15 45 19.86 | 1.725 | 19 12 36.7 | 5.97 | 3 26.2 | 25 | 16 8 50.80 | 2.159 | 20 26 0.9 | 6.05 | 1 51.7 |
| 26 | 15 46 1.51 | 1.742 | 19 15 0.1 | 5.99 | 3 23.0 | 26 | 16 9 42.75 | 2.170 | 20 28 25.9 | 6.03 | 1 48.7 |
| 27 | 15 46 43.47 | 1.760 | 19 17 24.1 | 6.01 | 3 19.8 | 27 | 16 10 34.94 | 2.180 | 20 30 50.4 | 6.01 | 1 45.6 |
| 28 | 15 47 26.05 | 1 778 | 19 19 48.6 | 6.03 | 3 16.6 | 28 | 16 11 27.39 | 2.190 | 20 33 14.4 | 5.99 | 1 42.5 |
| 29 | 15 48 8.94 | 1.795 | 19 22 13.6 | 6.05 | 3 13.4 | 29 | 16 12 20.08 | 2.200 | 20 35 37.9 | 5.97 | 1 39.4 |
| 30 | 15 48 52.23 | 1.812 | 19 24 39.0 | 6.07 | 3 10.2 | 30 | 16 13 13.01 | 2.210 | 20 38 0.9 | 5.95 | 1 36.3 |
| 31 | 15 49 35.94 | 1.829 | 19 27 4.9 | 6.09 | 3 7.0 | 31 | 16 14 6.17 | 2.220 | 20 40 23.3 | 5.92 | 1 33.3 |
| 32 | 15 50 20.03 | +1.845 | −19 29 31.2 | −6.10 | 3 3.8 | 32 | 16 14 59.56 | +2.230 | −20 42 44.9 | −5.89 | 1 30.3 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. | Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|---|---|---|---|---|
| Semidiameter | 17″.1 | 16″.6 | 16″.2 | 15″.9 | Semidiameter | 15″.9 | 15″.6 | 15″.4 | 15″.2 |
| Horizontal Parallax | 1.6 | 1.6 | 1.5 | 1.5 | Horizontal Parallax | 1.5 | 1.5 | 1.4 | 1.4 |

NOTE.—North declinations are marked +, south declinations

## GREENWICH MEAN TIME.

### NOVEMBER.

| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
|---|---|---|---|---|---|
| | *Noon.* | *Noon.* | *Noon.* | *Noon.* | |
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 16 14 59.56 | +2.230 | −20 42 44.9 | −5.89 | 1 30.3 |
| 2 | 16 15 53.18 | 2.239 | 20 45 5.9 | 5.87 | 1 27.2 |
| 3 | 16 16 47.01 | 2.248 | 20 47 26.3 | 5.84 | 1 24.2 |
| 4 | 16 17 41.05 | 2.257 | 20 49 46.1 | 5.81 | 1 21.1 |
| 5 | 16 18 35.31 | 2.265 | 20 52 5.2 | 5.78 | 1 18.0 |
| 6 | 16 19 29.76 | 2.273 | 20 54 23.5 | 5.75 | 1 15.0 |
| 7 | 16 20 24.41 | 2.281 | 20 56 41.0 | 5.72 | 1 12.0 |
| 8 | 16 21 19.26 | 2.289 | 20 58 57.6 | 5.69 | 1 9.0 |
| 9 | 16 22 14.29 | 2.297 | 21 1 13.5 | 5.65 | 1 6.0 |
| 10 | 16 23 9.50 | 2.305 | 21 3 28.6 | 5.61 | 1 3.0 |
| 11 | 16 24 4.89 | 2.312 | 21 5 42.8 | 5.57 | 1 0.0 |
| 12 | 16 25 0.45 | 2.319 | 21 7 56.1 | 5.53 | 0 57.0 |
| 13 | 16 25 56.18 | 2.326 | 21 10 8.5 | 5.49 | 0 54.0 |
| 14 | 16 26 52.07 | 2.332 | 21 12 19.9 | 5.45 | 0 51.0 |
| 15 | 16 27 48.11 | 2.338 | 21 14 30.3 | 5.41 | 0 48.0 |
| 16 | 16 28 44.30 | 2.344 | 21 16 39.7 | 5.37 | 0 45.0 |
| 17 | 16 29 40.63 | 2.350 | 21 18 48.1 | 5.33 | 0 42.0 |
| 18 | 16 30 37.09 | 2.355 | 21 20 55.5 | 5.29 | 0 39.0 |
| 19 | 16 31 33.67 | 2.360 | 21 23 1.9 | 5.25 | 0 36.0 |
| 20 | 16 32 30.37 | 2.365 | 21 25 7.1 | 5.20 | 0 33.0 |
| 21 | 16 33 27.19 | 2.370 | 21 27 11.3 | 5.15 | 0 30.0 |
| 22 | 16 34 24.12 | 2.374 | 21 29 14.3 | 5.10 | 0 27.0 |
| 23 | 16 35 21.16 | 2.378 | 21 31 16.2 | 5.05 | 0 24.0 |
| 24 | 16 36 18.29 | 2.382 | 21 33 16.9 | 5.00 | 0 21.0 |
| 25 | 16 37 15.51 | 2.386 | 21 35 16.5 | 4.95 | 0 18.0 |
| 26 | 16 38 12.81 | 2.389 | 21 37 14.8 | 4.90 | 0 15.0 |
| 27 | 16 39 10.20 | 2.392 | 21 39 11.8 | 4.85 | 0 12.1 |
| 28 | 16 40 7.65 | 2.395 | 21 41 7.6 | 4.80 | 0 9.1 |
| 29 | 16 41 5.18 | 2.398 | 21 43 2.3 | 4.75 | 0 6.1 |
| 30 | 16 42 2.76 | 2.401 | 21 44 55.7 | 4.70 | 0 3.1 |
| 31 | 16 43 0.40 | 2.403 | 21 46 47.8 | 4.64 | 0 0.1<br>23 57.1 |
| 32 | 16 43 58.10 | +2.405 | −21 48 38.6 | −4.59 | 23 54.1 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Semidiameter | 15.″2 | 15.″0 | 15.″0 | 14.″9 |
| Horizontal Parallax | 1.4 | 1.4 | 1.4 | 1.4 |

### DECEMBER.

| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
|---|---|---|---|---|---|
| | *Noon.* | *Noon.* | *Noon.* | *Noon.* | |
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 16 43 0.40 | +2.403 | −21 46 47.8 | −4.64 | 0 0.1<br>23 57.1 |
| 2 | 16 43 58.10 | 2.405 | 21 48 38.6 | 4.59 | 23 54.1 |
| 3 | 16 44 55.84 | 2.407 | 21 50 28.2 | 4.54 | 23 51.2 |
| 4 | 16 45 53.62 | 2.409 | 21 52 16.4 | 4.49 | 23 48.3 |
| 5 | 16 46 51.44 | 2.410 | 21 54 3.3 | 4.43 | 23 45.4 |
| 6 | 16 47 49.29 | 2.411 | 21 55 48.9 | 4.37 | 23 42.4 |
| 7 | 16 48 47.17 | 2.412 | 21 57 33.2 | 4.32 | 23 39.5 |
| 8 | 16 49 45.07 | 2.413 | 21 59 16.1 | 4.27 | 23 36.5 |
| 9 | 16 50 42.98 | 2.413 | 22 0 57.6 | 4.21 | 23 33.5 |
| 10 | 16 51 40.90 | 2.413 | 22 2 37.7 | 4.15 | 23 30.6 |
| 11 | 16 52 38.82 | 2.413 | 22 4 16.5 | 4.09 | 23 27.6 |
| 12 | 16 53 36.74 | 2.413 | 22 5 53.9 | 4.03 | 23 24.6 |
| 13 | 16 54 34.65 | 2.412 | 22 7 29.8 | 3.97 | 23 21.6 |
| 14 | 16 55 32.53 | 2.411 | 22 9 4.3 | 3.91 | 23 18.6 |
| 15 | 16 56 30.39 | 2.410 | 22 10 37.4 | 3.85 | 23 15.7 |
| 16 | 16 57 28.22 | 2.409 | 22 12 9.0 | 3.79 | 23 12.7 |
| 17 | 16 58 26.01 | 2.407 | 22 13 39.2 | 3.73 | 23 9.7 |
| 18 | 16 59 23.75 | 2.405 | 22 15 7.9 | 3.67 | 23 6.7 |
| 19 | 17 0 21.43 | 2.403 | 22 16 35.1 | 3.60 | 23 3.8 |
| 20 | 17 1 19.05 | 2.400 | 22 18 0.9 | 3.54 | 23 0.8 |
| 21 | 17 2 16.62 | 2.397 | 22 19 25.2 | 3.48 | 22 57.8 |
| 22 | 17 3 14.11 | 2.394 | 22 20 48.0 | 3.42 | 22 54.8 |
| 23 | 17 4 11.51 | 2.390 | 22 22 9.4 | 3.36 | 22 51.8 |
| 24 | 17 5 8.82 | 2.386 | 22 23 19.3 | 3.30 | 22 48.8 |
| 25 | 17 6 6.04 | 2.382 | 22 24 47.8 | 3.24 | 22 45.8 |
| 26 | 17 7 3.16 | 2.378 | 22 26 4.8 | 3.18 | 22 42.9 |
| 27 | 17 8 0.17 | 2.373 | 22 27 20.3 | 3.12 | 22 39.9 |
| 28 | 17 8 57.07 | 2.368 | 22 28 34.3 | 3.06 | 22 36.9 |
| 29 | 17 9 53.87 | 2.363 | 22 29 46.9 | 3.00 | 22 33.9 |
| 30 | 17 10 50.54 | 2.358 | 22 30 57.9 | 2.93 | 22 30.9 |
| 31 | 17 11 47.08 | 2.353 | 22 32 7.5 | 2.87 | 22 27.9 |
| 32 | 17 12 43.49 | +2.347 | −22 33 15.6 | −2.81 | 22 24.9 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Semidiameter | 14.″9 | 14.″9 | 15.″0 | 15.″1 |
| Horizontal Parallax | 1.4 | 1.4 | 1.4 | 1.4 |

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

### JANUARY.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 21 43 54.01 | +0.970 | −15 2 28.5 | +4.97 | 3 1.5 |
| 2 | 21 44 17.40 | 0.979 | 15 0 28.6 | 5.02 | 2 57.9 |
| 3 | 21 44 41.00 | 0.988 | 14 58 27.6 | 5.07 | 2 54.4 |
| 4 | 21 45 4.80 | 0.996 | 14 56 25.4 | 5.11 | 2 50.8 |
| 5 | 21 45 28.79 | 1.003 | 14 54 22.1 | 5.16 | 2 47.3 |
| 6 | 21 45 52.96 | 1.012 | 14 52 17.7 | 5.20 | 2 43.8 |
| 7 | 21 46 17.32 | 1.019 | 14 50 12.3 | 5.25 | 2 40.2 |
| 8 | 21 46 41.86 | 1.026 | 14 48 5.9 | 5.29 | 2 36.7 |
| 9 | 21 47 6.58 | 1.034 | 14 45 58.6 | 5.32 | 2 33.2 |
| 10 | 21 47 31.48 | 1.041 | 14 43 50.3 | 5.36 | 2 29.7 |
| 11 | 21 47 56.56 | 1.048 | 14 41 41.1 | 5.40 | 2 26.2 |
| 12 | 21 48 21.80 | 1.055 | 14 39 31.0 | 5.44 | 2 22.7 |
| 13 | 21 48 47.19 | 1.061 | 14 37 20.0 | 5.48 | 2 19.2 |
| 14 | 21 49 12.73 | 1.067 | 14 35 8.0 | 5.52 | 2 15.7 |
| 15 | 21 49 38.42 | 1.073 | 14 32 55.1 | 5.56 | 2 12.1 |
| 16 | 21 50 4.25 | 1.079 | 14 30 41.3 | 5.59 | 2 8.6 |
| 17 | 21 50 30.23 | 1.085 | 14 28 26.7 | 5.62 | 2 5.1 |
| 18 | 21 50 56.35 | 1.091 | 14 26 11.4 | 5.65 | 2 1.7 |
| 19 | 21 51 22.60 | 1.096 | 14 23 55.3 | 5.69 | 1 58.2 |
| 20 | 21 51 48.98 | 1.102 | 14 21 38.4 | 5.72 | 1 54.7 |
| 21 | 21 52 15.49 | 1.107 | 14 19 20.8 | 5.75 | 1 51.2 |
| 22 | 21 52 42.11 | 1.111 | 14 17 2.5 | 5.78 | 1 47.7 |
| 23 | 21 53 8.84 | 1.116 | 14 14 43.5 | 5.81 | 1 44.2 |
| 24 | 21 53 35.69 | 1.121 | 14 12 23.7 | 5.84 | 1 40.7 |
| 25 | 21 54 2.65 | 1.126 | 14 10 3.2 | 5.87 | 1 37.2 |
| 26 | 21 54 29.72 | 1.130 | 14 7 42.0 | 5.90 | 1 33.7 |
| 27 | 21 54 56.88 | 1.134 | 14 5 20.2 | 5.92 | 1 30.3 |
| 28 | 21 55 24.13 | 1.137 | 14 2 57.9 | 5.94 | 1 26.8 |
| 29 | 21 55 51.46 | 1.140 | 14 0 35.1 | 5.96 | 1 23.3 |
| 30 | 21 56 18.86 | 1.143 | 13 58 11.8 | 5.98 | 1 19.8 |
| 31 | 21 56 46.33 | 1.146 | 13 55 48.0 | 6.00 | 1 16.3 |
| 32 | 21 57 13.87 | +1.149 | −13 53 23.6 | +6.02 | 1 12.9 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Polar Semidiameter | 7″.4 | 7″.4 | 7″.3 | 7″.3 |
| Horizontal Parallax | 0.8 | 0.8 | 0.8 | 0.8 |

### FEBRUARY.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 21 57 13.87 | +1.149 | −13 53 23.6 | +6.02 | 1 12.9 |
| 2 | 21 57 41.48 | 1.152 | 13 50 58.8 | 6.04 | 1 9.4 |
| 3 | 21 58 9.16 | 1.155 | 13 48 33.6 | 6.06 | 1 5.9 |
| 4 | 21 58 36.90 | 1.157 | 13 46 8.0 | 6.07 | 1 2.4 |
| 5 | 21 59 4.70 | 1.159 | 13 43 42.1 | 6.09 | 0 59.0 |
| 6 | 21 59 32.54 | 1.161 | 13 41 15.9 | 6.10 | 0 55.5 |
| 7 | 22 0 0.42 | 1.162 | 13 38 49.3 | 6.12 | 0 52.0 |
| 8 | 22 0 28.34 | 1.164 | 13 36 22.3 | 6.13 | 0 48.6 |
| 9 | 22 0 56.29 | 1.165 | 13 33 54.9 | 6.15 | 0 45.1 |
| 10 | 22 1 24.27 | 1.166 | 13 31 27.2 | 6.16 | 0 41.6 |
| 11 | 22 1 52.27 | 1.167 | 13 28 59.3 | 6.17 | 0 38.2 |
| 12 | 22 2 20.29 | 1.168 | 13 26 31.2 | 6.17 | 0 34.7 |
| 13 | 22 2 48.34 | 1.169 | 13 24 3.0 | 6.18 | 0 31.2 |
| 14 | 22 3 16.41 | 1.170 | 13 21 34.6 | 6.19 | 0 27.8 |
| 15 | 22 3 44.50 | 1.170 | 13 19 6.1 | 6.19 | 0 24.3 |
| 16 | 22 4 12.59 | 1.170 | 13 16 37.4 | 6.20 | 0 20.8 |
| 17 | 22 4 40.68 | 1.170 | 13 14 8.6 | 6.20 | 0 17.4 |
| 18 | 22 5 8.76 | 1.170 | 13 11 39.7 | 6.21 | 0 13.9 |
| 19 | 22 5 36.83 | 1.169 | 13 9 10.7 | 6.21 | 0 10.4 |
| 20 | 22 6 4.88 | 1.169 | 13 6 41.6 | 6.21 | 0 7.0 |
| 21 | 22 6 32.92 | 1.168 | 13 4 12.4 | 6.21 | 0 3.5 |
| 22 | 22 7 0.94 | 1.167 | 13 1 43.3 | 6.21 | 0 0.0<br>23 56.6 |
| 23 | 22 7 28.93 | 1.166 | 12 59 14.3 | 6.21 | 23 53.1 |
| 24 | 22 7 56.90 | 1.165 | 12 56 45 4 | 6.20 | 23 49.6 |
| 25 | 22 8 24.84 | 1.163 | 12 54 16.7 | 6.19 | 23 46.2 |
| 26 | 22 8 52.74 | 1.161 | 12 51 48.1 | 6.19 | 23 42.7 |
| 27 | 22 9 20.59 | 1.159 | 12 49 19.6 | 6.18 | 23 39.2 |
| 28 | 22 9 48.39 | 1.157 | 12 46 51.3 | 6.18 | 23 35.8 |
| 29 | 22 10 16.14 | 1.155 | 12 44 23.1 | 6.17 | 23 32.3 |
| 30 | 22 10 43.84 | 1.153 | 12 41 55.1 | 6.16 | 23 28.8 |
| 31 | 22 11 11.48 | 1.150 | 12 39 27.4 | 6.15 | 23 25.3 |
| 32 | 22 11 39.05 | +1.147 | −12 37 0.0 | +6.14 | 23 21.9 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Polar Semidiameter | 7″.3 | 7″.2 | 7″.2 | 7″.3 |
| Horizontal Parallax | 0.8 | 0.8 | 0.8 | 0.8 |

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

| MARCH.<br>Day of Month. | Apparent Right Ascension.<br>Noon. | Var. of R. A. for 1 Hour.<br>Noon. | Apparent Declination.<br>Noon. | Var. of Dec. for 1 Hour.<br>Noon. | Meridian Passage. | APRIL.<br>Day of Month. | Apparent Right Ascension.<br>Noon. | Var. of R. A. for 1 Hour.<br>Noon. | Apparent Declination.<br>Noon. | Var. of Dec. for 1 Hour.<br>Noon. | Meridian Passage. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m | | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 22 10 43.84 | +1.153 | −12 41 55.1 | +6.16 | 23 28.8 | 1 | 22 24 12.04 | +0.993 | −11 29 39.7 | +5.32 | 21 40.2 |
| 2 | 22 11 11.48 | 1.160 | 12 39 27.4 | 6.15 | 23 25.3 | 2 | 22 24 35.78 | 0.985 | 11 27 32.4 | 5.28 | 21 36.7 |
| 3 | 22 11 39.05 | 1.147 | 12 37 0.0 | 6.14 | 23 21.9 | 3 | 22 24 59.34 | 0.978 | 11 25 26.2 | 5.24 | 21 33.2 |
| 4 | 22 12 6.54 | 1.144 | 12 34 32.9 | 6.12 | 23 18.4 | 4 | 22 25 22.71 | 0.970 | 11 23 21.1 | 5.19 | 21 29.6 |
| 5 | 22 12 33.96 | 1.141 | 12 32 6.2 | 6.11 | 23 14.9 | 5 | 22 25 45.89 | 0.962 | 11 21 17.1 | 5.14 | 21 26.1 |
| 6 | 22 13 1.30 | 1.137 | 12 29 39.8 | 6.09 | 23 11.4 | 6 | 22 26 8.87 | 0.953 | 11 19 14.2 | 5.10 | 21 22.5 |
| 7 | 22 13 28.55 | 1.134 | 12 27 13.8 | 6.07 | 23 7.9 | 7 | 22 26 31.64 | 0.944 | 11 17 12.4 | 5.05 | 21 19.0 |
| 8 | 22 13 55.72 | 1.130 | 12 24 48.2 | 6.06 | 23 4.4 | 8 | 22 26 54.20 | 0.936 | 11 15 11.9 | 5.00 | 21 15.4 |
| 9 | 22 14 22.80 | 1.126 | 12 22 23.0 | 6.04 | 23 1.0 | 9 | 22 27 16.55 | 0.927 | 11 13 12.6 | 4.94 | 21 11.8 |
| 10 | 22 14 49.79 | 1.123 | 12 19 58.3 | 6.02 | 22 57.5 | 10 | 22 27 38.69 | 0.918 | 11 11 14.6 | 4.89 | 21 8.3 |
| 11 | 22 15 16.69 | 1.119 | 12 17 34.1 | 6.00 | 22 54.0 | 11 | 22 28 0.61 | 0.909 | 11 9 17.9 | 4.84 | 21 4.7 |
| 12 | 22 15 43.49 | 1.114 | 12 15 10.4 | 5.98 | 22 50.5 | 12 | 22 28 22.31 | 0.900 | 11 7 22.4 | 4.79 | 21 1.1 |
| 13 | 22 16 10.18 | 1.110 | 12 12 47.2 | 5.96 | 22 47.0 | 13 | 22 28 43.79 | 0.890 | 11 5 28.1 | 4.74 | 20 57.5 |
| 14 | 22 16 36.76 | 1.105 | 12 10 24.5 | 5.93 | 22 43.5 | 14 | 22 29 5.05 | 0.881 | 11 3 35.1 | 4.68 | 20 53.9 |
| 15 | 22 17 3.22 | 1.100 | 12 8 2.4 | 5.91 | 22 40.0 | 15 | 22 29 26.08 | 0.871 | 11 1 43.4 | 4.62 | 20 50.4 |
| 16 | 22 17 29.57 | 1.095 | 12 5 40.9 | 5.88 | 22 36.5 | 16 | 22 29 46.88 | 0.862 | 10 59 53.1 | 4.56 | 20 46.8 |
| 17 | 22 17 55.80 | 1.090 | 12 3 20.0 | 5.86 | 22 33.0 | 17 | 22 30 7.44 | 0.852 | 10 58 4.3 | 4.50 | 20 43.2 |
| 18 | 22 18 21.90 | 1.085 | 12 0 59.8 | 5.83 | 22 29.5 | 18 | 22 30 27.76 | 0.841 | 10 56 16.9 | 4.45 | 20 39.6 |
| 19 | 22 18 47.88 | 1.080 | 11 58 40.3 | 5.80 | 22 26.0 | 19 | 22 30 47.83 | 0.831 | 10 54 30.9 | 4.39 | 20 36.0 |
| 20 | 22 19 13.73 | 1.074 | 11 56 21.4 | 5.77 | 22 22.5 | 20 | 22 31 7.66 | 0.821 | 10 52 46.4 | 4.32 | 30 32.4 |
| 21 | 22 19 39.45 | 1.069 | 11 54 3.2 | 5.74 | 22 19.0 | 21 | 22 31 27.21 | 0.810 | 10 51 3.4 | 4.26 | 20 28.8 |
| 22 | 22 20 5.03 | 1.063 | 11 51 45.8 | 5.71 | 22 15.5 | 22 | 22 31 46.56 | 0.799 | 10 49 21.9 | 4.20 | 20 25.1 |
| 23 | 22 20 30.46 | 1.056 | 11 49 29.2 | 5.68 | 22 12.0 | 23 | 22 32 5.61 | 0.788 | 10 47 42.0 | 4.13 | 20 21.5 |
| 24 | 22 20 55.73 | 1.050 | 11 47 13.4 | 5.64 | 22 8.5 | 24 | 22 32 24.39 | 0.777 | 10 46 3.6 | 4.07 | 20 17.9 |
| 25 | 22 21 20.85 | 1.043 | 11 44 58.5 | 5.60 | 22 4.9 | 25 | 22 32 42.91 | 0.766 | 10 44 26.7 | 4.00 | 20 14.3 |
| 26 | 22 21 45.81 | 1.037 | 11 42 44.4 | 5.57 | 22 1.4 | 26 | 22 33 1.16 | 0.755 | 10 42 51.4 | 3.93 | 20 10.6 |
| 27 | 22 22 10.61 | 1.030 | 11 40 31.2 | 5.53 | 21 57.9 | 27 | 22 33 19.13 | 0.743 | 10 41 17.8 | 8.86 | 20 7.0 |
| 28 | 22 22 35.25 | 1.023 | 11 38 18.9 | 5.49 | 21 54.4 | 28 | 22 33 36.82 | 0.731 | 10 39 46.0 | 3.79 | 20 3.4 |
| 29 | 22 22 59.72 | 1.016 | 11 36 7.6 | 5.45 | 21 50.8 | 29 | 22 33 54.24 | 0.720 | 10 38 15.9 | 3.72 | 19 59.7 |
| 30 | 22 23 24.01 | 1.008 | 11 33 57.3 | 5.41 | 21 47.3 | 30 | 22 34 11.38 | 0.708 | 10 36 47.5 | 3.65 | 19 56.1 |
| 31 | 22 23 48.12 | 1.001 | 11 31 48.0 | 5.37 | 21 43.8 | 31 | 22 34 28.23 | 0.696 | 10 35 20.8 | 3.58 | 19 52.4 |
| 32 | 22 24 12.04 | +0.993 | −11 29 39.7 | +5.32 | 21 40.2 | 32 | 22 34 44.79 | +0.684 | −10 33 55.8 | +3.51 | 19 48.8 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. | Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|---|---|---|---|---|
| Polar Semidiameter | 7″.3 | 7″.3 | 7″.3 | 7″.4 | Polar Semidiameter | 7″.4 | 7″.5 | 7″.6 | 7″.7 |
| Horizontal Parallax | 0.8 | 0.8 | 0.8 | 0.8 | Horizontal Parallax | 0.8 | 0.9 | 0.9 | 0.9 |

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing: — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

| MAY. | | | | | | JUNE. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
| | *Noon.* | *Noon.* | *Noon.* | *Noon.* | | | *Noon.* | *Noon.* | *Noon.* | *Noon.* | |
| | h m s | s | ° ′ ″ | ″ | h m | | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 22 34 28.23 | +0.696 | −10 35 20.8 | +3.58 | 19 52.4 | 1 | 22 40 33.93 | +0.270 | −10 6 18.4 | +1.00 | 17 56.4 |
| 2 | 22 34 44.79 | 0.684 | 10 33 55.8 | 3.51 | 19 48.8 | 2 | 22 40 40.24 | 0.255 | 10 5 55.5 | 0.91 | 17 52.6 |
| 3 | 22 35 1.06 | 0.672 | 10 32 32.5 | 3.43 | 19 45.1 | 3 | 22 40 46.18 | 0.240 | 10 5 34.8 | 0.82 | 17 48.8 |
| 4 | 22 35 17.03 | 0.659 | 10 31 11.0 | 3.36 | 19 41.4 | 4 | 22 40 51.76 | 0.225 | 10 5 16.3 | 0.73 | 17 44.9 |
| 5 | 22 35 32.71 | 0.647 | 10 29 51.2 | 3.29 | 19 37.7 | 5 | 22 40 56.97 | 0.209 | 10 5 0.0 | 0.64 | 17 41.1 |
| 6 | 22 35 48.09 | 0.635 | 10 28 33.2 | 3.21 | 19 34.1 | 6 | 22 41 1.81 | 0.194 | 10 4 45.8 | 0.54 | 17 37.2 |
| 7 | 22 36 3.17 | 0.622 | 10 27 17.1 | 3.13 | 19 30.4 | 7 | 22 41 6.29 | 0.179 | 10 4 33.9 | 0.45 | 17 33.4 |
| 8 | 22 36 17.94 | 0.609 | 10 26 2.9 | 3.05 | 19 26.7 | 8 | 22 41 10.41 | 0.164 | 10 4 24.2 | 0.36 | 17 29.5 |
| 9 | 22 36 32.40 | 0.596 | 10 24 50.6 | 2.97 | 19 23.0 | 9 | 22 41 14.17 | 0.149 | 10 4 16.7 | 0.27 | 17 25.6 |
| 10 | 22 36 46.56 | 0.583 | 10 23 40.1 | 2.90 | 19 19.3 | 10 | 22 41 17.56 | 0.133 | 10 4 11.4 | 0.17 | 17 21.8 |
| 11 | 22 37 0.41 | 0.570 | 10 22 31.5 | 2.82 | 19 15.6 | 11 | 22 41 20.57 | 0.118 | 10 4 8.4 | +0.08 | 17 17.9 |
| 12 | 22 37 13.94 | 0.557 | 10 21 24.8 | 2.74 | 19 11.9 | 12 | 22 41 23.21 | 0.102 | 10 4 7.6 | −0.01 | 17 14.0 |
| 13 | 22 37 27.14 | 0.543 | 10 20 20.0 | 2.66 | 19 8.2 | 13 | 22 41 25.47 | 0.086 | 10 4 9.0 | 0.10 | 17 10.1 |
| 14 | 22 37 40.02 | 0.530 | 10 19 17.2 | 2.58 | 19 4.4 | 14 | 22 41 27.35 | 0.071 | 10 4 12.6 | 0.20 | 17 6.2 |
| 15 | 22 37 52.58 | 0.516 | 10 18 16.4 | 2.49 | 19 0.7 | 15 | 22 41 28.86 | 0.055 | 10 4 18.4 | 0.29 | 17 2.3 |
| 16 | 22 38 4.81 | 0.503 | 10 17 17.6 | 2.41 | 18 57.0 | 16 | 22 41 30.00 | 0.040 | 10 4 26.5 | 0.38 | 16 58.3 |
| 17 | 22 38 16.71 | 0.489 | 10 16 20.8 | 2.33 | 18 53.2 | 17 | 22 41 30.77 | 0.024 | 10 4 36.8 | 0.48 | 16 54.4 |
| 18 | 22 38 28.28 | 0.475 | 10 15 25.9 | 2.25 | 18 49.5 | 18 | 22 41 31.16 | +0.009 | 10 4 49.4 | 0.57 | 16 50.5 |
| 19 | 22 38 39.52 | 0.461 | 10 14 33.0 | 2.16 | 18 45.7 | 19 | 22 41 31.18 | −0.007 | 10 5 4.2 | 0.66 | 16 46.6 |
| 20 | 22 38 50.42 | 0.447 | 10 13 42.1 | 2.08 | 18 42.0 | 20 | 22 41 30.83 | 0.023 | 10 5 21.2 | 0.75 | 16 42.6 |
| 21 | 22 39 0.98 | 0.433 | 10 12 53.3 | 1.99 | 18 38.2 | 21 | 22 41 30.10 | 0.038 | 10 5 40.4 | 0.85 | 16 38.7 |
| 22 | 22 39 11.19 | 0.418 | 10 12 6.7 | 1.90 | 18 34.4 | 22 | 22 41 29.00 | 0.054 | 10 6 1.8 | 0.94 | 16 34.7 |
| 23 | 22 39 21.06 | 0.404 | 10 11 22.2 | 1.81 | 18 30.7 | 23 | 22 41 27.52 | 0.069 | 10 6 25.5 | 1.03 | 16 30.7 |
| 24 | 22 39 30.58 | 0.389 | 10 10 39.9 | 1.72 | 18 26.9 | 24 | 22 41 25.67 | 0.085 | 10 6 51.4 | 1.12 | 16 26.8 |
| 25 | 22 39 39.74 | 0.374 | 10 9 59.7 | 1.63 | 18 23.1 | 25 | 22 41 23.45 | 0.100 | 10 7 19.5 | 1.21 | 16 22.8 |
| 26 | 22 39 48.54 | 0.359 | 10 9 21.7 | 1.54 | 18 19.3 | 26 | 22 41 20.86 | 0.116 | 10 7 49.7 | 1.30 | 16 18.8 |
| 27 | 22 39 56.99 | 0.345 | 10 8 45.8 | 1.45 | 18 15.5 | 27 | 22 41 17.90 | 0.131 | 10 8 22.0 | 1.39 | 16 14.8 |
| 28 | 22 40 5.09 | 0.330 | 10 8 12.0 | 1.36 | 18 11.7 | 28 | 22 41 14.58 | 0.146 | 10 8 56.4 | 1.48 | 16 10.8 |
| 29 | 22 40 12.84 | 0.315 | 10 7 40.3 | 1.27 | 18 7.9 | 29 | 22 41 10.89 | 0.161 | 10 9 33.0 | 1.57 | 16 6.8 |
| 30 | 22 40 20.23 | 0.300 | 10 7 10.8 | 1.18 | 18 4.1 | 30 | 22 41 6.84 | 0.176 | 10 10 11.7 | 1.65 | 16 2.8 |
| 31 | 22 40 27.26 | 0.285 | 10 6 43.5 | 1.09 | 18 0.3 | 31 | 22 41 2.43 | 0.191 | 10 10 52.4 | 1.74 | 15 58.8 |
| 32 | 22 40 33.93 | +0.270 | −10 6 18.4 | +1.00 | 17 56.4 | 32 | 22 40 57.67 | −0.206 | −10 11 35.2 | −1.82 | 15 54.8 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Polar Semidiameter | 7″.7 | 7″.8 | 7″.9 | 8″.1 |
| Horizontal Parallax | 0.9 | 0.9 | 0.9 | 0.9 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Polar Semidiameter | 8″.1 | 8″.2 | 8″.4 | 8″.5 |
| Horizontal Parallax | 0.9 | 0.9 | 0.9 | 1.0 |

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

| JULY. | | | | | | AUGUST. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. | Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
| | h m s | s | ° ′ ″ | ″ | h m | | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 22 41 2.43 | −0.191 | −10 10 52.4 | −1.74 | 15 58.8 | 1 | 22 36 3.59 | −0.583 | −10 46 59.7 | −3.87 | 13 51.9 |
| 2 | 22 40 57.67 | 0.206 | 10 11 35.2 | 1.82 | 15 54.8 | 2 | 22 35 49.48 | 0.592 | 10 48 33.2 | 3.92 | 13 47.7 |
| 3 | 22 40 52.55 | 0.221 | 10 12 20.0 | 1.91 | 15 50.8 | 3 | 22 35 35.16 | 0.601 | 10 50 7.7 | 3.96 | 13 43.5 |
| 4 | 22 40 47.07 | 0.236 | 10 13 6.9 | 2.00 | 15 46.8 | 4 | 22 35 20.64 | 0.609 | 10 51 43.1 | 3.99 | 13 39.4 |
| 5 | 22 40 41.24 | 0.250 | 10 13 55.8 | 2.08 | 15 42.7 | 5 | 22 35 5.92 | 0.618 | 10 53 19.4 | 4.03 | 13 35.2 |
| 6 | 22 40 35.06 | 0.265 | 10 14 46.6 | 2.16 | 15 38.7 | 6 | 22 34 51.00 | 0.626 | 10 54 56.6 | 4.07 | 13 31.0 |
| 7 | 22 40 28.54 | 0.279 | 10 15 39.4 | 2.24 | 15 34.7 | 7 | 22 34 35.89 | 0.633 | 10 56 34.7 | 4.11 | 13 26.8 |
| 8 | 22 40 21.68 | 0.293 | 10 16 34.1 | 2.32 | 15 30.6 | 8 | 22 34 20.60 | 0.641 | 10 58 13.7 | 4.14 | 13 22.6 |
| 9 | 22 40 14.49 | 0.306 | 10 17 30.8 | 2.40 | 15 26.6 | 9 | 22 34 5.13 | 0.648 | 10 59 53.4 | 4.17 | 13 18.5 |
| 10 | 22 40 6.97 | 0.320 | 10 18 29.4 | 2.48 | 15 22.5 | 10 | 22 33 49.49 | 0.655 | 11 1 33.8 | 4.20 | 13 14.3 |
| 11 | 22 39 59.11 | 0.335 | 10 19 29.8 | 2.56 | 15 18.4 | 11 | 22 33 33.69 | 0.661 | 11 3 14.8 | 4.22 | 13 10.1 |
| 12 | 22 39 50.91 | 0.349 | 10 20 32.1 | 2.63 | 15 14.4 | 12 | 22 33 17.74 | 0.667 | 11 4 56.4 | 4.25 | 13 5.9 |
| 13 | 22 39 42.37 | 0.363 | 10 21 36.2 | 2.71 | 15 10.3 | 13 | 22 33 1.65 | 0.673 | 11 6 38.6 | 4.27 | 13 1.7 |
| 14 | 22 39 33.50 | 0.376 | 10 22 42.2 | 2.79 | 15 6.2 | 14 | 22 32 45.43 | 0.679 | 11 8 21.3 | 4.29 | 12 57.5 |
| 15 | 22 39 24.31 | 0.389 | 10 23 50.0 | 2.86 | 15 2.1 | 15 | 22 32 29.08 | 0.684 | 11 10 4.4 | 4.30 | 12 53.3 |
| 16 | 22 39 14.81 | 0.402 | 10 24 59.5 | 2.93 | 14 58.0 | 16 | 22 32 12.61 | 0.689 | 11 11 47.9 | 4.32 | 12 49.1 |
| 17 | 22 39 5.00 | 0.415 | 10 26 10.7 | 3.00 | 14 53.9 | 17 | 22 31 56.03 | 0.693 | 11 13 31.8 | 4.34 | 12 44.9 |
| 18 | 22 38 54.88 | 0.428 | 10 27 23.5 | 3.07 | 14 49.8 | 18 | 22 31 39.34 | 0.697 | 11 15 16.1 | 4.35 | 12 40.7 |
| 19 | 22 38 44.45 | 0.441 | 10 28 38.0 | 3.14 | 14 45.7 | 19 | 22 31 22.56 | 0.701 | 11 17 0.6 | 4.36 | 12 36.4 |
| 20 | 22 38 33.72 | 0.453 | 10 29 54.2 | 3.21 | 14 41.6 | 20 | 22 31 5.70 | 0.704 | 11 18 45.2 | 4.36 | 12 32.2 |
| 21 | 22 38 22.69 | 0.465 | 10 31 12.0 | 3.27 | 14 37.5 | 21 | 22 30 48.77 | 0.707 | 11 20 29.9 | 4.36 | 12 28.0 |
| 22 | 22 38 11.38 | 0.477 | 10 32 31.3 | 3.33 | 14 33.4 | 22 | 22 30 31.78 | 0.709 | 11 22 14.6 | 4.36 | 12 23.8 |
| 23 | 22 37 59.78 | 0.489 | 10 33 52.0 | 3.39 | 14 29.2 | 23 | 22 30 14.73 | 0.711 | 11 23 59.4 | 4.36 | 12 19.6 |
| 24 | 22 37 47.90 | 0.501 | 10 35 14.2 | 3.45 | 14 25.1 | 24 | 22 29 57.63 | 0.713 | 11 25 44.1 | 4.36 | 12 15.4 |
| 25 | 22 37 35.75 | 0.512 | 10 36 37.8 | 3.51 | 14 21.0 | 25 | 22 29 40.49 | 0.715 | 11 27 28.7 | 4.35 | 12 11.2 |
| 26 | 22 37 23.33 | 0.523 | 10 38 2.8 | 3.57 | 14 16.8 | 26 | 22 29 23.32 | 0.716 | 11 29 13.1 | 4.35 | 12 6.9 |
| 27 | 22 37 10.65 | 0.534 | 10 39 29.2 | 3.63 | 14 12.7 | 27 | 22 29 6.14 | 0.716 | 11 30 57.4 | 4.34 | 12 2.7 |
| 28 | 22 36 57.72 | 0.544 | 10 40 56.9 | 3.68 | 14 8.5 | 28 | 22 28 48.96 | 0.716 | 11 32 41.5 | 4.33 | 11 58.5 |
| 29 | 22 36 44.54 | 0.554 | 10 42 25.9 | 3.73 | 14 4.4 | 29 | 22 28 31.78 | 0.716 | 11 34 25.3 | 4.31 | 11 54.3 |
| 30 | 22 36 31.12 | 0.564 | 10 43 56.0 | 3.78 | 14 0.2 | 30 | 22 28 14.61 | 0.715 | 11 36 8.6 | 4.29 | 11 50.1 |
| 31 | 22 36 17.47 | 0.574 | 10 45 27.3 | 3.83 | 13 56.0 | 31 | 22 27 57.45 | 0.715 | 11 37 51.4 | 4.27 | 11 45.9 |
| 32 | 22 36 3.59 | −0.583 | −10 46 59.7 | −3.87 | 13 51.9 | 32 | 22 27 40.30 | −0.714 | −11 39 33.7 | −4.25 | 11 41.6 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. | Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|---|---|---|---|---|
| Polar Semidiameter | 8″.5 | 8″.6 | 8″.7 | 8″.8 | Polar Semidiameter | 8″.8 | 8″.9 | 8″.9 | 8″.9 |
| Horizontal Parallax | 1.0 | 1.0 | 1.0 | 1.0 | Horizontal Parallax | 1.0 | 1.0 | 1.0 | 1.0 |

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## GREENWICH MEAN TIME.

### SEPTEMBER.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 22 27 40.30 | −0.714 | −11 39 33.7 | −4.25 | 11 41.6 |
| 2 | 22 27 23.18 | 0.712 | 11 41 15.5 | 4.23 | 11 37.4 |
| 3 | 22 27 6.11 | 0.710 | 11 42 56.7 | 4.20 | 11 33.2 |
| 4 | 22 26 49.10 | 0.707 | 11 44 37.3 | 4.18 | 11 29.0 |
| 5 | 22 26 32.15 | 0.705 | 11 46 17.3 | 4.15 | 11 24.8 |
| 6 | 22 26 15.27 | 0.702 | 11 47 56.6 | 4.12 | 11 20.6 |
| 7 | 22 25 58.47 | 0.698 | 11 49 35.2 | 4.09 | 11 16.4 |
| 8 | 22 25 41.75 | 0.694 | 11 51 13.0 | 4.05 | 11 12.2 |
| 9 | 22 25 25.13 | 0.690 | 11 52 49.8 | 4.01 | 11 7.9 |
| 10 | 22 25 8.62 | 0.686 | 11 54 25.7 | 3.98 | 11 3.7 |
| 11 | 22 24 52.22 | 0.681 | 11 56 0.7 | 3.94 | 10 59.5 |
| 12 | 22 24 35.93 | 0.676 | 11 57 34.7 | 3.89 | 10 55.3 |
| 13 | 22 24 19.77 | 0.670 | 11 59 7.6 | 3.85 | 10 51.1 |
| 14 | 22 24 3.76 | 0.664 | 12 0 39.4 | 3.80 | 10 46.9 |
| 15 | 22 23 47.90 | 0.658 | 12 2 10.1 | 3.75 | 10 42.7 |
| 16 | 22 23 32.19 | 0.651 | 12 3 39.6 | 3.70 | 10 38.6 |
| 17 | 22 23 16.64 | 0.644 | 12 5 7.9 | 3.65 | 10 34.4 |
| 18 | 22 23 1.27 | 0.637 | 12 6 34.9 | 3.60 | 10 30.2 |
| 19 | 22 22 46.08 | 0.629 | 12 8 0.5 | 3.54 | 10 26.0 |
| 20 | 22 22 31.09 | 0.620 | 12 9 24.7 | 3.48 | 10 21.8 |
| 21 | 22 22 16.30 | 0.612 | 12 10 47.5 | 3.42 | 10 17.7 |
| 22 | 22 22 1.71 | 0.603 | 12 12 8.8 | 3.36 | 10 13.5 |
| 23 | 22 21 47.34 | 0.594 | 12 13 28.6 | 3.29 | 10 9.3 |
| 24 | 22 21 33.20 | 0.584 | 12 14 46.8 | 3.22 | 10 5.2 |
| 25 | 22 21 19.29 | 0.575 | 12 16 3.4 | 3.16 | 10 1.0 |
| 26 | 22 21 5.62 | 0.565 | 12 17 18.5 | 3.10 | 9 56.8 |
| 27 | 22 20 52.19 | 0.554 | 12 18 32.0 | 3.03 | 9 52.7 |
| 28 | 22 20 39.01 | 0 544 | 12 19 43.8 | 2.95 | 9 48.5 |
| 29 | 22 20 26.09 | 0.533 | 12 20 53.8 | 2.88 | 9 44.4 |
| 30 | 22 20 13.44 | 0.521 | 12 22 2.0 | 2.81 | 9 40.3 |
| 31 | 22 20 1.06 | 0.510 | 12 23 8.5 | 2.73 | 9 36.1 |
| 32 | 22 19 48.96 | −0.498 | −12 24 13.2 | −2.66 | 9 32.0 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Polar Semidiameter | 8″.9 | 8″.9 | 8″.8 | 8″.8 |
| Horizontal Parallax | 1.0 | 1.0 | 1.0 | 1.0 |

### OCTOBER.

| Day of Month. | Apparent Right Ascension. Noon. | Var. of R. A. for 1 Hour. Noon. | Apparent Declination. Noon. | Var. of Dec. for 1 Hour. Noon. | Meridian Passage. |
|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 22 20 1.06 | −0.510 | −12 23 8.5 | −2.73 | 9 36.1 |
| 2 | 22 19 48.96 | 0.498 | 12 24 13.2 | 2.66 | 9 32.0 |
| 3 | 22 19 37.14 | 0.487 | 12 25 16.0 | 2.58 | 9 27.9 |
| 4 | 22 19 25.60 | 0.475 | 12 26 17.0 | 2.50 | 9 23.7 |
| 5 | 22 19 14.36 | 0.462 | 12 27 16.1 | 2.42 | 9 19.6 |
| 6 | 22 19 3.43 | 0.449 | 12 28 13.4 | 2.35 | 9 15.5 |
| 7 | 22 18 52.81 | 0.436 | 12 29 8.8 | 2.27 | 9 11.4 |
| 8 | 22 18 42.50 | 0.423 | 12 30 2.2 | 2.18 | 9 7.3 |
| 9 | 22 18 32.50 | 0.410 | 12 30 53.6 | 2.10 | 9 3.2 |
| 10 | 22 18 22.82 | 0.396 | 12 31 43.0 | 2.01 | 8 59.1 |
| 11 | 22 18 13.47 | 0.383 | 12 32 30.3 | 1.93 | 8 55.0 |
| 12 | 22 18 4.45 | 0.369 | 12 33 15.6 | 1.84 | 8 51.0 |
| 13 | 22 17 55.77 | 0.355 | 12 33 58.8 | 1.76 | 8 46.9 |
| 14 | 22 17 47.43 | 0.340 | 12 34 39.9 | 1.67 | 8 42.8 |
| 15 | 22 17 39.44 | 0.326 | 12 35 18.9 | 1.58 | 8 38.7 |
| 16 | 22 17 31.80 | 0.311 | 12 35 55.8 | 1.49 | 8 34.7 |
| 17 | 22 17 24.51 | 0.296 | 12 36 30.5 | 1.40 | 8 30.6 |
| 18 | 22 17 17.58 | 0.281 | 12 37 3.1 | 1.31 | 8 26.6 |
| 19 | 22 17 11.02 | 0.265 | 12 37 33.5 | 1.22 | 8 22.5 |
| 20 | 22 17 4.84 | 0.250 | 12 38 1.7 | 1.13 | 8 18.5 |
| 21 | 22 16 59.03 | 0.234 | 12 38 27.6 | 1.03 | 8 14.5 |
| 22 | 22 16 53.60 | 0.219 | 12 38 51.2 | 0.94 | 8 10.5 |
| 23 | 22 16 48.54 | 0.203 | 12 39 12.6 | 0.85 | 8 6.5 |
| 24 | 22 16 43.86 | 0.187 | 12 39 31.8 | 0.75 | 8 2.4 |
| 25 | 22 16 39.56 | 0.171 | 12 39 48.8 | 0.66 | 7 58.4 |
| 26 | 22 16 35.65 | 0.155 | 12 40 3.6 | 0.57 | 7 54.5 |
| 27 | 22 16 32.13 | 0.139 | 12 40 16.1 | 0.47 | 7 50.5 |
| 28 | 22 16 29.00 | 0.122 | 12 40 26.3 | 0.38 | 7 46.5 |
| 29 | 22 16 26.26 | 0.106 | 12 40 34.3 | 0.29 | 7 42.5 |
| 30 | 22 16 23.90 | 0.090 | 12 40 40.0 | 0.19 | 7 38.6 |
| 31 | 22 16 21.93 | 0.074 | 12 40 43.4 | −0.09 | 7 34.6 |
| 32 | 22 16 20.36 | −0.057 | −12 40 44.5 | 0.00 | 7 30.6 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|
| Polar Semidiameter | 8″.8 | 8″.7 | 8″.5 | 8″.4 |
| Horizontal Parallax | 1.0 | 1.0 | 1.0 | 1.0 |

NOTE.—North declinations are marked +, south declinations —.

## GREENWICH MEAN TIME.

| | NOVEMBER. | | | | | | DECEMBER. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Dec. for 1 Hour. | Meridian Passage. |
| | *Noon.* | *Noon.* | *Noon.* | *Noon.* | | | *Noon.* | *Noon.* | *Noon.* | *Noon.* | |
| | h m s | s | ° ′ ″ | ″ | h m | | h m s | s | ° ′ ″ | ″ | h m |
| 1 | 22 16 20.36 | −0.057 | −12 40 44.5 | 0.00 | 7 30.6 | 1 | 22 18 37.48 | +0.432 | −12 23 51.8 | +2.76 | 5 35.0 |
| 2 | 22 16 19.18 | 0.041 | 12 40 43.3 | +0.10 | 7 26.7 | 2 | 22 18 48.03 | 0.447 | 12 22 44.5 | 2.85 | 5 31.2 |
| 3 | 22 16 18.40 | 0.024 | 12 40 39.9 | 0.19 | 7 22.7 | 3 | 22 18 58.95 | 0.462 | 12 21 35.1 | 2.93 | 5 27.5 |
| 4 | 22 16 18.02 | −0.008 | 12 40 34.2 | 0.29 | 7 18.8 | 4 | 22 19 10.23 | 0.477 | 12 20 23.7 | 3.02 | 5 23.7 |
| 5 | 22 16 18.03 | +0.009 | 12 40 26.2 | 0.38 | 7 14.9 | 5 | 22 19 21.87 | 0.492 | 12 19 10.2 | 3.10 | 5 20.0 |
| 6 | 22 16 18.44 | 0.025 | 12 40 16.0 | 0.47 | 7 10.9 | 6 | 22 19 33.86 | 0.507 | 12 17 54.7 | 3.19 | 5 16.3 |
| 7 | 22 16 19.24 | 0.042 | 12 40 3.5 | 0.57 | 7 7.0 | 7 | 22 19 46.20 | 0.521 | 12 16 37.3 | 3.27 | 5 12.6 |
| 8 | 22 16 20.44 | 0.059 | 12 39 48.7 | 0.66 | 7 3.1 | 8 | 22 19 58.89 | 0.536 | 12 15 17.9 | 3.35 | 5 8.8 |
| 9 | 22 16 22.05 | 0.075 | 12 39 31.7 | 0.76 | 6 59.2 | 9 | 22 20 11.93 | 0.551 | 12 13 56.6 | 3.43 | 5 5.1 |
| 10 | 22 16 24.06 | 0.092 | 12 39 12.4 | 0.85 | 6 55.3 | 10 | 22 20 25.33 | 0.565 | 12 12 33.3 | 3.51 | 5 1.4 |
| 11 | 22 16 26.47 | 0.109 | 12 38 50.8 | 0.95 | 6 51.4 | 11 | 22 20 39.07 | 0.580 | 12 11 8.1 | 3.59 | 4 57.7 |
| 12 | 22 16 29.28 | 0.125 | 12 38 26.9 | 1.04 | 6 47.6 | 12 | 22 20 53.15 | 0.594 | 12 9 41.0 | 3.67 | 4 54.0 |
| 13 | 22 16 32.49 | 0.142 | 12 38 0.8 | 1.14 | 6 43.7 | 13 | 22 21 7.56 | 0.608 | 12 8 12.0 | 3.75 | 4 50.3 |
| 14 | 22 16 36.10 | 0.159 | 12 37 32.4 | 1.23 | 6 39.8 | 14 | 22 21 22.31 | 0.621 | 12 6 41.1 | 3.82 | 4 46.6 |
| 15 | 22 16 40.10 | 0.175 | 12 37 1.7 | 1.33 | 6 35.9 | 15 | 22 21 37.39 | 0.635 | 12 5 8.4 | 3.90 | 4 42.9 |
| 16 | 22 16 44.50 | 0.192 | 12 36 28.8 | 1.42 | 6 32.1 | 16 | 22 21 52.79 | 0.648 | 12 3 33.8 | 3.98 | 4 39.3 |
| 17 | 22 16 49.30 | 0.208 | 12 25 53.6 | 1.51 | 6 28.2 | 17 | 22 22 8.51 | 0.662 | 12 1 57.4 | 4.05 | 4 35.6 |
| 18 | 22 16 54.50 | 0.225 | 12 35 16.2 | 1.60 | 6 24.4 | 18 | 22 22 24.55 | 0.675 | 12 0 19.2 | 4.13 | 4 31.9 |
| 19 | 22 17 0.10 | 0.242 | 12 34 36.6 | 1.70 | 6 20.6 | 19 | 22 22 40.90 | 0.688 | 11 58 39.3 | 4.20 | 4 28.3 |
| 20 | 22 17 6.10 | 0.258 | 12 33 54.8 | 1.79 | 6 16.7 | 20 | 22 22 57.57 | 0.701 | 11 56 57.6 | 4.27 | 4 24.6 |
| 21 | 22 17 12.49 | 0.274 | 12 33 10.8 | 1.88 | 6 12.9 | 21 | 22 23 14.54 | 0.713 | 11 55 14.2 | 4.34 | 4 21.0 |
| 22 | 22 17 19.27 | 0.291 | 12 32 24.6 | 1.97 | 6 9.1 | 22 | 22 23 31.81 | 0.726 | 11 53 29.1 | 4.41 | 4 17.3 |
| 23 | 22 17 26.44 | 0.307 | 12 31 36.2 | 2.06 | 6 5.3 | 23 | 22 23 49.37 | 0.738 | 11 51 42.3 | 4.48 | 4 13.7 |
| 24 | 22 17 33.99 | 0.323 | 12 30 45.6 | 2.15 | 6 1.5 | 24 | 22 24 7.23 | 0.750 | 11 49 53.9 | 4.55 | 4 10.1 |
| 25 | 22 17 41.93 | 0.339 | 12 29 52.8 | 2.25 | 5 57.7 | 25 | 22 24 25.38 | 0.762 | 11 48 3.8 | 4.62 | 4 6.4 |
| 26 | 22 17 50.25 | 0.355 | 12 28 57.8 | 2.34 | 5 53.9 | 26 | 22 24 43.82 | 0.774 | 11 46 12.1 | 4 69 | 4 2.8 |
| 27 | 22 17 58.95 | 0.370 | 12 28 0.7 | 2.42 | 5 50.1 | 27 | 22 25 2.54 | 0.786 | 11 44 18.9 | 4.75 | 3 59.2 |
| 28 | 22 18 8.02 | 0.386 | 12 27 1.5 | 2.51 | 5 46.3 | 28 | 22 25 21.53 | 0.797 | 11 42 24.1 | 4.81 | 3 55.6 |
| 29 | 22 18 17.47 | 0.401 | 12 26 0.3 | 2.59 | 5 42.5 | 29 | 22 25 40.79 | 0.808 | 11 40 27.8 | 4.88 | 3 52.0 |
| 30 | 22 18 27.29 | 0.417 | 12 24 57.1 | 2.68 | 5 38.8 | 30 | 22 26 0.31 | 0.819 | 11 38 29.9 | 4.94 | 3 48.3 |
| 31 | 22 18 37.48 | 0.432 | 12 23 51.8 | 2.76 | 5 35.0 | 31 | 22 26 20.09 | 0.830 | 11 36 30.5 | 5.00 | 3 44.7 |
| 32 | 22 18 48.03 | +0.447 | −12 22 44.5 | +2.85 | 5 31.2 | 32 | 22 26 40.13 | +0.840 | −11 34 29.7 | +5.06 | 3 41.1 |

| Day of the Month. | 1st. | 11th. | 21st. | 31st. | Day of the Month. | 1st. | 11th. | 21st. | 31st. |
|---|---|---|---|---|---|---|---|---|---|
| Polar Semidiameter | 8″.4 | 8″.3 | 8″.1 | 8″.0 | Polar Semidiameter | 8″.0 | 7″.8 | 7″.7 | 7″.6 |
| Horizontal Parallax | 0.9 | 0.9 | 0.9 | 0.9 | Horizontal Parallax | 0.9 | 0.9 | 0.9 | 0.9 |

+ prefixed to the hourly change of declination, indicates that north declinations are increasing and south declinations are decreasing; — indicates that north declinations are decreasing and south declinations increasing.

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Day of Month. | JANUARY. |  | FEBRUARY. |  | MARCH. |  |
|---|---|---|---|---|---|---|
|  | True Longitude. | Latitude. | True Longitude. | Latitude. | True Longitude. | Latitude. |
| 1.0 | 333° 1′ 41″.5 | −2° 29′ 5″.8 | 22° 2′ 42″.4 | +1° 55′ 51″.8 | 46° 23′ 12″0 | +3° 52′ 9″.1 |
| 1.5 | 339 19 7.7 | 1 59 27.0 | 28 48 26.2 | 2 28 48.2 | 53 21 54.7 | 4 16 24.4 |
| 2.0 | 345 40 1.9 | 1 28 1.0 | 35 38 19.6 | 2 59 58.0 | 60 22 48.8 | 4 36 57.6 |
| 2.5 | 352 4 49.3 | 0 55 7.2 | 42 32 31.3 | 3 28 50.5 | 67 25 44.4 | 4 53 26.2 |
| 3.0 | 358 33 56.4 | −0 21 7.1 | 49 31 6.1 | 3 54 55.5 | 74 30 29.0 | 5 5 31.8 |
| 3.5 | 5 7 49.8 | +0 13 35.8 | 56 34 3.9 | 4 17 43.6 | 81 36 48.3 | 5 13 0.2 |
| 4.0 | 11 46 55.1 | 0 48 35.6 | 63 41 18.1 | 4 36 47.1 | 88 44 25.4 | 5 15 41.3 |
| 4.5 | 18 31 36.6 | 1 23 24.2 | 70 52 35.0 | 4 51 40.8 | 95 53 0.4 | 5 13 30.3 |
| 5.0 | 25 22 13.9 | 1 57 31.1 | 78 7 32.6 | 5 2 2.9 | 103 2 10.4 | 5 6 27.7 |
| 5.5 | 32 19 1.8 | 2 30 23.7 | 85 25 40.3 | 5 7 36.4 | 110 11 30.2 | 4 54 39.2 |
| 6.0 | 39 22 7.9 | 3 1 27.9 | 92 46 19.1 | 5 8 9.5 | 117 20 31.4 | 4 38 16.4 |
| 6.5 | 46 31 30.7 | 3 30 8.0 | 100 8 42.2 | 5 3 37.2 | 124 28 43.7 | 4 17 36.2 |
| 7.0 | 53 46 57.4 | 3 55 48.3 | 107 31 56.6 | 4 54 1.5 | 131 35 35.6 | 3 53 0.4 |
| 7.5 | 61 8 3.3 | 4 17 54.2 | 114 55 4.4 | 4 39 31.8 | 138 40 34.7 | 3 25 55.7 |
| 8.0 | 68 34 10.7 | 4 35 53.4 | 122 17 5.5 | 4 20 25 1 | 145 43 9.2 | 2 54 52.4 |
| 8.5 | 76 4 29.1 | 4 49 17.8 | 129 36 59.9 | 3 57 5.0 | 152 42 48.2 | 2 20 24.0 |
| 9.0 | 83 37 56.2 | 4 57 44.8 | 136 53 50.1 | 3 30 1.0 | 159 39 3.3 | 1 45 5.8 |
| 9.5 | 91 13 19.8 | 5 0 59.5 | 144 6 43.9 | 2 59 47.3 | 166 31 29.5 | 1 8 33.8 |
| 10.0 | 98 49 20.7 | 4 58 55.4 | 151 14 55.5 | 2 27 1.1 | 173 19 45.2 | +0 31 24.1 |
| 10.5 | 106 24 36.2 | 4 51 34.8 | 158 17 47.6 | 1 52 20.8 | 180 3 33.7 | −0 5 48.6 |
| 11.0 | 113 57 44.3 | 4 39 9.2 | 165 14 52.1 | 1 16 25.2 | 186 42 43.3 | 0 42 31.7 |
| 11.5 | 121 27 27.0 | 4 21 58.8 | 172 5 50.5 | 0 39 51.6 | 193 17 7.2 | 1 18 14.9 |
| 12.0 | 128 52 34.2 | 4 0 30.5 | 178 50 33.5 | +0 3 14.9 | 199 46 44.1 | 1 52 31.4 |
| 12.5 | 136 12 6.0 | 3 35 17.0 | 185 29 0.8 | −0 32 52.9 | 206 11 38.2 | 2 24 57.4 |
| 13.0 | 143 25 15.0 | 3 6 54.3 | 192 1 29.5 | 1 8 3.2 | 212 31 58.1 | 2 55 12.5 |
| 13.5 | 150 31 27.3 | 2 36 0.5 | 198 27 47.3 | 1 41 51.0 | 218 47 57.8 | 3 22 59.8 |
| 14.0 | 157 30 22.2 | 2 3 13.6 | 204 48 42.5 | 2 13 54.9 | 224 59 55.3 | 3 48 5.4 |
| 14.5 | 164 21 51.9 | 1 29 10.3 | 211 4 32.0 | 2 43 56.6 | 231 8 12.3 | 4 10 17.8 |
| 15.0 | 171 6 0.2 | 0 54 25.2 | 217 15 46.1 | 3 11 41.0 | 237 13 14.0 | 4 29 28.3 |
| 15.5 | 177 43 0.5 | +0 19 30.0 | 223 22 57.8 | 3 36 55.1 | 243 15 28.7 | 4 45 30.0 |
| 16.0 | 184 13 14.9 | −0 15 7.0 | 229 26 42.5 | 3 59 28.4 | 249 15 26.9 | 4 58 17.7 |
| 16.5 | 190 37 11.6 | 0 49 0.6 | 235 27 36.9 | 4 19 12.0 | 255 13 40.8 | 5 7 47.7 |
| 17.0 | 196 55 23.8 | 1 21 48.6 | 241 26 18.2 | 4 35 58.5 | 261 10 44.1 | 5 13 57.4 |
| 17.5 | 203 8 28.1 | 1 53 11.6 | 247 23 23.5 | 4 49 41.5 | 267 7 11.7 | 5 16 44.9 |
| 18.0 | 209 17 3.0 | 2 22 52.8 | 253 19 29.5 | 5 0 15.6 | 273 3 38.8 | 5 16 9.2 |
| 18.5 | 215 21 48.1 | 2 50 37.4 | 259 15 11.9 | 5 7 36.3 | 279 0 40.4 | 5 12 10.3 |
| 19.0 | 221 23 23.2 | 3 16 12.3 | 265 11 4.6 | 5 11 39.9 | 284 58 51.2 | 5 4 48.8 |
| 19.5 | 227 22 27.0 | 3 39 26.0 | 271 7 39.8 | 5 12 23.4 | 290 58 45.1 | 4 54 6.2 |
| 20.0 | 233 19 37.2 | 4 0 8.0 | 277 5 27.4 | 5 9 44.4 | 297 0 54.7 | 4 40 4.9 |
| 20.5 | 239 15 29.5 | 4 18 9.0 | 283 4 54.7 | 5 3 42.1 | 303 5 50.7 | 4 22 48.9 |
| 21.0 | 245 10 37.1 | 4 33 20.6 | 289 6 26.1 | 4 54 16.4 | 309 14 1.1 | 4 2 23.6 |
| 21.5 | 251 5 30.6 | 4 45 34.9 | 295 10 23.3 | 4 41 29.1 | 315 25 51.9 | 3 38 56.5 |
| 22.0 | 257 0 37.8 | 4 54 45.2 | 301 17 4.5 | 4 25 23.5 | 321 41 44.9 | 3 12 37.5 |
| 22.5 | 262 56 23.3 | 5 0 45.7 | 307 26 44.9 | 4 6 5.3 | 328 1 58.7 | 2 43 38.8 |
| 23.0 | 268 53 8.6 | 5 3 31.3 | 313 39 36.3 | 3 43 42.3 | 334 26 47.4 | 2 12 16.1 |
| 23.5 | 274 51 12.2 | 5 2 58.6 | 319 55 47.3 | 3 18 25.1 | 340 56 20.5 | 1 38 48.2 |
| 24.0 | 280 50 49.8 | 4 59 5.5 | 326 15 23.3 | 2 50 26.9 | 347 30 42.3 | 1 3 37.5 |
| 24.5 | 286 52 13.9 | 4 51 51.2 | 332 38 26.9 | 2 20 4.3 | 354 9 51.5 | −0 27 9.7 |
| 25.0 | 292 55 34.7 | 4 41 17.1 | 339 4 58.1 | 1 47 36.8 | 0 53 42.1 | +0 10 5.8 |
| 25.5 | 299 1 0.2 | 4 27 26.5 | 345 34 54.8 | 1 13 26.7 | 7 42 2.3 | 0 47 37.0 |
| 26.0 | 305 8 36.6 | 4 10 24.8 | 352 8 12.9 | 0 37 59.1 | 14 34 35.5 | 1 24 49.3 |
| 26.5 | 311 18 29.0 | 3 50 20.1 | 358 44 47.2 | −0 1 41.8 | 21 31 0.6 | 2 1 6.6 |
| 27.0 | 317 30 41.3 | 3 27 22.5 | 5 24 31.7 | +0 34 55.9 | 28 30 52.2 | 2 35 52.0 |
| 27 5 | 323 45 17.5 | 3 1 44.8 | 12 7 19.7 | 1 11 22.8 | 35 33 42.1 | 3 8 29.2 |
| 28.0 | 330 2 21.9 | 2 33 42.0 | 18 53 4.4 | 1 47 6.6 | 42 38 59.8 | 3 38 23.5 |
| 28.5 | 336 21 59.5 | 2 3 31.5 | 25 41 39.0 | 2 21 34.9 | 49 46 13.4 | 4 5 2.6 |
| 29.0 | 342 44 16.6 | 1 31 33.0 | 32 32 56.6 | 2 54 15.4 | 56 54 50.5 | 4 27 57.7 |
| 29.5 | 349 9 20.8 | 0 58 8.2 | 39 26 50.0 | 3 24 36.8 | 64 4 18.8 | 4 46 44.6 |
| 30.0 | 355 37 21.5 | −0 23 40.7 | 46 23 12.0 | 3 52 9.1 | 71 14 7.8 | 5 1 4.1 |
| 30.5 | 2 8 29.6 | +0 11 24.4 | 53 21 54.7 | 4 16 24.4 | 78 23 48.8 | 5 10 42.0 |
| 31.0 | 8 42 57.0 | 0 46 40.5 | 60 22 48.8 | 4 36 57.5 | 85 32 55.5 | 5 15 29.5 |
| 31.5 | 15 20 57.1 | +1 21 39.3 | 67 25 44.4 | +4 53 26.2 | 92 41 4.1 | +5 15 24.1 |

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Day of Month. | APRIL. | | MAY. | | JUNE. | |
|---|---|---|---|---|---|---|
| | True Longitude. | Latitude. | True Longitude. | Latitude. | True Longitude. | Latitude. |
| 1.0 | 99° 47′ 53″.5 | +5° 10′ 28″.5 | 138° 41′ 23″.5 | +3° 17′ 35″.2 | 188° 42′ 14″.9 | −1° 6′ 5″.4 |
| 1.5 | 106 53 5.6 | 5 0 49.9 | 145 32 3.1 | 2 47 42.4 | 195 3 24.1 | 1 38 25.7 |
| 2.0 | 113 56 25.0 | 4 46 40.8 | 152 18 28.4 | 2 15 46.2 | 201 21 3.8 | 2 9 13.6 |
| 2.5 | 120 57 38.4 | 4 28 17.8 | 159 0 48.7 | 1 42 16.6 | 207 35 36.9 | 2 38 10.6 |
| 3.0 | 127 56 34.5 | 4 6 1.4 | 165 39 15.7 | 1 7 43.9 | 213 47 24.2 | 3 4 59.6 |
| 3.5 | 134 53 3.6 | 3 40 15.6 | 172 14 1.7 | +0 32 37.1 | 219 56 44.5 | 3 29 25.8 |
| 4.0 | 141 46 57.7 | 3 11 26.8 | 178 45 19.4 | −0 2 35.1 | 226 3 54.8 | 3 51 15.8 |
| 4.5 | 148 38 9.0 | 2 40 4.0 | 185 13 20.9 | 0 37 25.7 | 232 9 9.6 | 4 10 18.4 |
| 5.0 | 155 26 30.8 | 2 6 37.6 | 191 38 17.9 | 1 11 28.7 | 238 12 41.5 | 4 26 24.0 |
| 5.5 | 162 11 56.6 | 1 31 39.3 | 198 0 20.6 | 1 44 19.9 | 244 14 41.7 | 4 39 24.4 |
| 6.0 | 168 54 20.4 | 0 55 41.2 | 204 19 37.8 | 2 15 37.0 | 250 15 20.2 | 4 49 14.2 |
| 6.5 | 175 33 36.4 | +0 19 14.9 | 210 36 17.3 | 2 44 59.2 | 256 14 46.1 | 4 55 49.3 |
| 7.0 | 182 9 39.1 | −0 17 8.1 | 216 50 26.0 | 3 12 8.2 | 262 13 8.7 | 4 59 7.3 |
| 7.5 | 188 42 24.1 | 0 52 58.0 | 223 2 10.0 | 3 36 47.7 | 268 10 37.1 | 4 59 8.2 |
| 8.0 | 195 11 47.4 | 1 27 46.6 | 229 11 35.1 | 3 58 43.8 | 274 7 21.7 | 4 55 53.0 |
| 8.5 | 201 37 46.6 | 2 1 8.0 | 235 18 47.6 | 4 17 44.9 | 280 3 33.9 | 4 49 24.8 |
| 9.0 | 208 0 21.1 | 2 32 38.9 | 241 23 53.9 | 4 33 41.6 | 285 59 26.7 | 4 39 48.3 |
| 9.5 | 214 19 31.8 | 3 1 58.7 | 247 27 1.9 | 4 46 26.9 | 291 55 15.2 | 4 27 9.2 |
| 10.0 | 220 35 22.8 | 3 28 49.5 | 253 28 21.4 | 4 55 55.8 | 297 51 17.1 | 4 11 34.9 |
| 10.5 | 226 47 59.9 | 3 52 56.5 | 259 28 3.3 | 5 2 5.6 | 303 47 52.3 | 3 53 13.9 |
| 11.0 | 232 57 32.6 | 4 14 7.5 | 265 26 21.5 | 5 4 55.0 | 309 45 23.9 | 3 32 15.7 |
| 11.5 | 239 4 12.9 | 4 32 13.0 | 271 23 32.2 | 5 4 24.5 | 315 44 16.9 | 3 8 51.0 |
| 12.0 | 245 8 16.0 | 4 47 5.9 | 277 19 53.9 | 5 0 36.7 | 321 44 59.8 | 2 43 11.6 |
| 12.5 | 251 10 0.1 | 4 58 41.1 | 283 15 48.0 | 4 53 34.7 | 327 48 3.2 | 2 15 30.7 |
| 13.0 | 257 9 46.4 | 5 6 55.5 | 289 11 39.0 | 4 43 22.5 | 333 54 0.1 | 1 46 2.0 |
| 13.5 | 263 7 58.7 | 5 11 47.4 | 295 7 53.7 | 4 30 46.0 | 340 3 25.2 | 1 16 1.3 |
| 14.0 | 269 5 3.6 | 5 13 16.4 | 301 5 1.7 | 4 13 51.4 | 346 16 54.0 | 0 42 45.7 |
| 14.5 | 275 1 30.2 | 5 11 23.6 | 307 3 34.9 | 3 54 46.3 | 352 35 2.8 | −0 9 34.2 |
| 15.0 | 280 57 49.4 | 5 6 10.7 | 313 4 7.3 | 3 32 58.8 | 358 58 27.7 | +0 24 12.3 |
| 15.5 | 286 54 34.2 | 4 57 39.9 | 319 7 14.6 | 3 8 38.5 | 5 27 42.9 | 0 58 10.5 |
| 16.0 | 292 52 18.8 | 4 45 55.3 | 325 13 33.6 | 2 41 56.1 | 12 3 19.6 | 1 31 54.6 |
| 16.5 | 298 51 38.6 | 4 31 0.7 | 331 23 41.9 | 2 13 4.0 | 18 45 44.8 | 2 4 56.4 |
| 17.0 | 304 53 9.5 | 4 13 1.7 | 337 38 16.1 | 1 42 16.2 | 25 35 19.4 | 2 36 45.1 |
| 17.5 | 310 57 27.2 | 3 52 4.5 | 343 57 52.9 | 1 9 48.9 | 32 32 16.3 | 3 6 47.6 |
| 18.0 | 317 5 7.2 | 3 28 17.1 | 350 23 6.2 | 0 36 1.0 | 39 36 37.7 | 3 34 29.4 |
| 18.5 | 323 16 43.7 | 3 1 48.9 | 356 54 26.9 | −0 1 14.3 | 46 48 14.1 | 3 59 14.8 |
| 19.0 | 329 32 48.8 | 2 32 51.7 | 3 32 21.2 | +0 34 6.5 | 54 6 42.8 | 4 20 28.9 |
| 19.5 | 335 53 51.9 | 2 1 39.6 | 10 17 9.1 | 1 9 33.3 | 61 31 26.8 | 4 37 38.5 |
| 20.0 | 342 20 18.7 | 1 28 29.8 | 17 9 2.6 | 1 44 34.5 | 69 1 35.1 | 4 50 14.4 |
| 20.5 | 348 52 30.2 | 0 53 42.6 | 24 8 4.1 | 2 18 35.7 | 76 36 3.3 | 4 57 52.6 |
| 21.0 | 355 30 41.5 | −0 17 41.7 | 31 14 5.3 | 2 50 59.9 | 84 13 36.4 | 5 0 16.9 |
| 21.5 | 2 15 1.0 | +0 19 5.1 | 38 26 45.6 | 3 21 8.7 | 91 52 50.8 | 4 57 19.3 |
| 22.0 | 9 5 29.0 | 0 56 6.6 | 45 45 31.5 | 3 48 23.4 | 99 32 19.6 | 4 49 1.3 |
| 22.5 | 16 1 57.7 | 1 32 48.7 | 53 9 36.9 | 4 12 6.6 | 107 10 35.8 | 4 35 34.1 |
| 23.0 | 23 4 9.8 | 2 8 34.0 | 60 38 4.1 | 4 31 44.2 | 114 46 16.1 | 4 17 17.5 |
| 23.5 | 30 11 38.8 | 2 42 43.9 | 68 9 45.9 | 4 46 47.1 | 122 18 5.5 | 3 54 39.3 |
| 24.0 | 37 23 49.4 | 3 14 38.9 | 75 43 27.4 | 4 56 53.0 | 129 44 59.4 | 3 28 12.9 |
| 24.5 | 44 39 58.1 | 3 43 40.8 | 83 17 49.9 | 5 1 47.2 | 137 6 6.7 | 2 58 36.0 |
| 25.0 | 51 59 14.7 | 4 9 13.7 | 90 51 34.6 | 5 1 24.3 | 144 20 49.4 | 2 26 28.1 |
| 25.5 | 59 20 43.9 | 4 30 45.9 | 98 23 26.2 | 4 55 47.3 | 151 28 43.4 | 1 52 29.3 |
| 26.0 | 66 43 27.6 | 4 47 51.0 | 105 52 15.8 | 4 45 7.7 | 158 29 37.6 | 1 17 18.2 |
| 26.5 | 74 6 27.4 | 5 0 9.1 | 113 17 3.7 | 4 29 44.8 | 165 23 32.2 | 0 41 31.9 |
| 27.0 | 81 28 46.4 | 5 7 27.4 | 120 37 1.4 | 4 10 3.4 | 172 10 37.1 | +0 5 43.6 |
| 27.5 | 88 49 32.0 | 5 9 40.6 | 127 51 32.6 | 3 46 33.2 | 178 51 9.9 | −0 29 36.2 |
| 28.0 | 96 7 57.4 | 5 6 50.5 | 135 0 13.0 | 3 19 46.6 | 185 25 34.0 | 1 4 0.2 |
| 28.5 | 103 23 22.6 | 4 59 5.6 | 142 2 49.7 | 2 50 17.7 | 191 54 16.8 | 1 37 4.4 |
| 29.0 | 110 35 15.8 | 4 46 40.3 | 148 59 19.9 | 2 18 40.9 | 198 17 48.2 | 2 8 28.0 |
| 29.5 | 117 43 13.0 | 4 29 54.0 | 155 49 49.6 | 1 45 29.9 | 204 36 39.5 | 2 37 52.9 |
| 30.0 | 124 46 58.3 | 4 9 9.9 | 162 34 31.9 | 1 11 17.2 | 210 51 22.1 | 3 5 3.2 |
| 30.5 | 131 46 22.7 | 3 44 54.2 | 169 13 44.9 | 0 36 33.6 | 217 2 27.3 | 3 29 45.4 |
| 31.0 | 138 42 23.5 | 3 17 35.2 | 175 47 50.2 | +0 1 47.9 | 223 10 24.2 | 3 51 47.9 |
| 31.5 | 145 32 3.1 | +2 47 42.4 | 182 17 11.9 | −0 32 33.3 | 229 15 41.1 | −4 11 0.9 |

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Day of Month. | JULY. | | AUGUST. | | SEPTEMBER. | |
|---|---|---|---|---|---|---|
| | True Longitude. | Latitude. | True Longitude. | Latitude. | True Longitude. | Latitude. |
| 1.0 | 223° 10′ 24″.1 | −3° 51′ 47″.9 | 268° 6′ 4″.6 | −5° 6′ 11″.5 | 312° 22′ 0″.1 | −3° 12′ 54″.9 |
| 1.5 | 229 15 41.0 | 4 11 0.9 | 274 2 3.2 | 5 0 27.5 | 318 25 38.3 | 2 45 22.3 |
| 2.0 | 235 18 43.3 | 4 27 15.9 | 279 58 2.0 | 4 51 29.0 | 324 31 39.2 | 2 15 45.1 |
| 2.5 | 241 19 54.8 | 4 40 26.2 | 285 54 19.2 | 4 39 21.0 | 330 40 15.8 | 1 44 20.5 |
| 3.0 | 247 19 36.2 | 4 50 26.5 | 281 51 10.9 | 4 24 9.5 | 336 51 38.9 | 1 11 27.3 |
| 3.5 | 253 18 6.4 | 4 57 12.9 | 297 48 51.8 | 4 6 2.4 | 343 5 57.6 | 0 37 26.8 |
| 4.0 | 259 15 41.8 | 5 0 43.1 | 303 47 35.4 | 3 45 9.0 | 349 23 19.3 | −0 2 41.8 |
| 4.5 | 265 12 37.4 | 5 0 56.2 | 309 47 33.8 | 3 21 40.6 | 355 43 49.9 | +0 32 23.2 |
| 5.0 | 271 9 6.2 | 4 57 52.8 | 315 48 58.8 | 2 55 49.9 | 2 7 34.2 | 1 7 22.0 |
| 5.5 | 277 5 19.9 | 4 51 35.3 | 321 52 1.6 | 2 27 51.5 | 8 34 36.2 | 1 41 47.4 |
| 6.0 | 283 1 29.9 | 4 42 7.5 | 327 56 53.9 | 1 58 1.6 | 15 4 58.8 | 2 15 11.4 |
| 6.5 | 288 57 47.2 | 4 29 24.8 | 334 3 47.5 | 1 26 38.1 | 21 38 44.0 | 2 47 6.4 |
| 7.0 | 294 54 22.9 | 4 14 4.5 | 340 12 54.8 | 0 54 0.5 | 28 15 53.9 | 3 17 3.6 |
| 7.5 | 300 51 28.7 | 3 55 45.1 | 346 24 29.8 | −0 20 29.5 | 34 56 29.4 | 3 44 35.5 |
| 8.0 | 306 49 17.1 | 3 34 46.7 | 352 38 47.2 | +0 13 32.8 | 41 40 30.9 | 4 9 15.6 |
| 8.5 | 312 48 2.9 | 3 11 21.0 | 358 56 3.0 | 0 47 43.3 | 48 27 58.3 | 4 30 39.0 |
| 9.0 | 318 48 2.0 | 2 45 40.9 | 5 16 34.2 | 1 21 37.7 | 55 18 49.7 | 4 48 22.4 |
| 9.5 | 324 49 32.4 | 2 18 0.8 | 11 40 39.0 | 1 54 51.0 | 62 13 1.6 | 5 2 4.9 |
| 10.0 | 330 52 54.6 | 1 48 36.0 | 18 8 35.7 | 2 26 57.2 | 69 10 29.2 | 5 11 28.9 |
| 10.5 | 336 58 31.4 | 1 17 43.4 | 24 40 43.2 | 2 57 29.8 | 76 11 5.2 | 5 16 20.1 |
| 11.0 | 343 6 47.8 | 0 45 40.9 | 31 17 19.0 | 3 26 2.1 | 83 14 39.6 | 5 16 27.9 |
| 11.5 | 349 18 10.7 | −0 12 47.9 | 37 58 39.4 | 3 52 6.9 | 90 20 59.0 | 5 11 46.5 |
| 12.0 | 355 33 9.0 | +0 20 35.3 | 44 44 58.4 | 4 15 17.4 | 97 29 46.7 | 5 2 15.0 |
| 12.5 | 1 52 12.4 | 0 54 6.6 | 51 36 26.3 | 4 35 7.4 | 104 40 42.1 | 4 47 57.7 |
| 13.0 | 8 15 51.2 | 1 27 22.6 | 58 33 8.8 | 4 51 11.6 | 111 53 20.6 | 4 29 4 7 |
| 13.5 | 14 44 35.4 | 1 59 58.2 | 65 35 5.9 | 5 3 7.0 | 119 7 13.9 | 4 5 51.7 |
| 14.0 | 21 18 53.3 | 2 31 27.0 | 72 42 10.4 | 5 10 32.8 | 126 21 49.8 | 3 38 40.9 |
| 14.5 | 27 59 10.9 | 3 1 21.0 | 79 54 7.2 | 5 13 12.4 | 133 36 33.2 | 3 7 58.6 |
| 15.0 | 34 45 49.8 | 3 29 10.8 | 87 10 32.6 | 5 10 53.4 | 140 50 46.4 | 2 34 17.3 |
| 15.5 | 41 39 6.0 | 3 54 26.0 | 94 30 54.1 | 5 3 29.3 | 148 3 50.5 | 1 58 13.1 |
| 16.0 | 48 39 7.7 | 4 16 36.1 | 101 54 30.2 | 4 51 0.5 | 155 15 5.8 | 1 20 25.2 |
| 16.5 | 55 45 54.1 | 4 35 10.8 | 109 20 31.2 | 4 33 34.4 | 162 23 53.3 | 0 41 34.0 |
| 17.0 | 62 59 13.2 | 4 49 40.9 | 116 48 1.2 | 4 11 26.3 | 169 29 35.8 | +0 2 20.9 |
| 17.5 | 70 18 41.0 | 4 59 40.5 | 124 15 59.1 | 3 44 59.3 | 176 31 39.0 | −0 36 33.9 |
| 18.0 | 77 43 40.6 | 5 4 47.7 | 131 43 21.4 | 3 14 43.3 | 183 29 32.8 | 1 14 32.3 |
| 18.5 | 85 13 22.4 | 5 4 46.4 | 139 9 4.6 | 2 41 14.4 | 190 22 51.9 | 1 50 59.6 |
| 19.0 | 92 46 45.1 | 4 59 27.8 | 146 32 7.7 | 2 5 13.2 | 197 11 16.5 | 2 25 24.8 |
| 19.5 | 100 22 37.8 | 4 48 51.5 | 153 51 34.3 | 1 27 23.3 | 203 54 32.9 | 2 57 21.7 |
| 20.0 | 107 59 42.5 | 4 33 6.1 | 161 6 34.8 | 0 48 29.2 | 210 32 33.8 | 3 26 28.6 |
| 20.5 | 115 36 37.8 | 4 12 29.3 | 168 16 27.5 | +0 9 14.4 | 217 5 18.1 | 3 52 28.2 |
| 21.0 | 123 12 2.4 | 3 47 27.3 | 175 20 40.0 | −0 29 39.6 | 223 32 50.5 | 4 15 7.9 |
| 21.5 | 130 44 38.8 | 3 18 33.8 | 182 18 49.4 | 1 7 35.2 | 229 55 21.9 | 4 34 18.6 |
| 22.0 | 138 13 16.7 | 2 46 27.6 | 189 10 42.1 | 1 43 58.4 | 236 13 8.1 | 4 49 54.7 |
| 22.5 | 145 36 55.6 | 2 11 51.1 | 195 56 13.6 | 2 18 20.5 | 242 26 29.4 | 5 1 53.8 |
| 23.0 | 152 54 46.4 | 1 35 28.2 | 202 35 27.8 | 2 50 17.8 | 248 35 50.1 | 5 10 15.6 |
| 23.5 | 160 6 12.6 | 0 58 2.4 | 209 8 35.8 | 3 19 31.0 | 254 41 37.6 | 5 15 1.6 |
| 24.0 | 167 10 50.3 | +0 20 15.2 | 215 35 54.8 | 3 45 44.9 | 260 44 22.4 | 5 16 15.1 |
| 24.5 | 174 8 27.9 | −0 17 15.6 | 221 57 47.3 | 4 8 48.4 | 266 44 36.9 | 5 14 0.0 |
| 25.0 | 180 59 4.3 | 0 53 55.1 | 228 14 39.8 | 4 28 33.4 | 272 42 54.9 | 5 8 21.6 |
| 25.5 | 187 42 47.9 | 1 29 14.0 | 234 27 1.7 | 4 44 54.1 | 278 39 51.3 | 4 59 25.6 |
| 26.0 | 194 19 55.2 | 2 2 46.8 | 240 35 24.9 | 4 57 44.8 | 284 36 1.5 | 4 47 18.5 |
| 26.5 | 200 50 48.5 | 2 34 12.3 | 246 40 22.2 | 5 7 12.7 | 290 32 1.0 | 4 32 7.5 |
| 27.0 | 207 15 55.0 | 3 3 12.1 | 252 42 27.5 | 5 13 9.1 | 296 28 25 1 | 4 14 0.4 |
| 27.5 | 213 35 45.1 | 3 29 32.5 | 258 42 14.7 | 5 15 37.4 | 302 25 48.0 | 3 53 6.0 |
| 28.0 | 219 50 51.1 | 3 53 1.9 | 264 40 17.3 | 5 14 40.2 | 308 24 42.4 | 3 29 34.1 |
| 28.5 | 226 1 46.2 | 4 13 31.1 | 270 37 8.0 | 5 10 20.5 | 314 25 39.9 | 3 3 35.7 |
| 29.0 | 232 9 4.2 | 4 30 53.2 | 276 33 18.2 | 5 2 41.8 | 320 29 8.9 | 2 35 23.5 |
| 29.5 | 238 13 18.1 | 4 45 2.8 | 282 29 18.1 | 4 51 48.9 | 326 35 36.2 | 2 5 11.8 |
| 30.0 | 244 14 59.7 | 4 55 56.1 | 288 25 36.0 | 4 37 47.6 | 332 45 25.0 | 1 33 16.9 |
| 30.5 | 250 14 39.5 | 5 3 30.5 | 294 22 38.1 | 4 20 44.6 | 338 58 55.3 | 0 59 57.5 |
| 31.0 | 256 12 46.1 | 5 7 44.5 | 300 20 48.5 | 4 0 48.1 | 345 16 23.5 | −0 25 34.5 |
| 31.5 | 262 9 46.3 | 5 8 37.8 | 306 20 29.3 | −3 38 7.8 | 351 38 1.9 | +0 9 29.0 |

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Day of Month. | OCTOBER. | | NOVEMBER. | | DECEMBER. | |
|---|---|---|---|---|---|---|
| | True Longitude. | Latitude. | True Longitude. | Latitude. | True Longitude. | Latitude. |
| 1.0 | 345° 16′ 23″.5 | −0° 25′ 34″.5 | 33° 12′ 28″.3 | +3° 34′ 31″.0 | 70° 14′ 20″.7 | +4° 58′ 32″.3 |
| 1.5 | 351 38 1.9 | +0 9 29.0 | 40 12 3.8 | 3 59 30.6 | 77 40 46.3 | 4 59 49.6 |
| 2.0 | 358 3 58.2 | 0 44 47.5 | 47 16 12.8 | 4 21 5.2 | 85 9 25.6 | 4 55 59.6 |
| 2.5 | 4 34 15.8 | 1 19 53.2 | 54 24 17.0 | 4 38 47.0 | 92 39 5.7 | 4 47 3.5 |
| 3.0 | 11 8 53.7 | 1 54 17.1 | 61 35 32.2 | 4 52 12.2 | 100 8 34.0 | 4 33 10.7 |
| 3.5 | 17 47 46.4 | 2 27 28.6 | 68 49 10.3 | 5 1 1.9 | 107 36 41.6 | 4 14 38.8 |
| 4.0 | 24 30 43.8 | 2 58 56.7 | 76 4 21.2 | 5 5 3.5 | 115 2 25.7 | 3 51 52.0 |
| 4.5 | 31 17 32.2 | 3 28 10.4 | 83 20 14.9 | 5 4 10.6 | 122 24 52.7 | 3 25 20.5 |
| 5.0 | 38 7 54.3 | 3 54 39.8 | 90 36 3.8 | 4 58 23.8 | 129 43 19.1 | 2 55 38.2 |
| 5.5 | 45 1 30.2 | 4 17 56.7 | 97 51 4.1 | 4 47 50.0 | 136 57 12.2 | 2 23 22.0 |
| 6.0 | 51 57 57.8 | 4 37 35.6 | 105 4 37.1 | 4 32 42.3 | 144 6 10.5 | 1 49 9.7 |
| 6.5 | 58 56 53.6 | 4 53 14.1 | 112 16 10.8 | 4 13 19.1 | 151 10 2.2 | 1 13 38.8 |
| 7.0 | 65 57 53.5 | 5 4 33.9 | 119 25 19.7 | 3 50 3.4 | 158 8 44.7 | 0 37 25.6 |
| 7.5 | 73 0 33.6 | 5 11 21.2 | 126 31 45.1 | 3 23 21.8 | 165 2 22.6 | +0 1 5.0 |
| 8.0 | 80 4 30.9 | 5 13 26.9 | 133 35 14.4 | 2 53 43.7 | 171 51 6.0 | −0 34 50.9 |
| 8.5 | 87 9 23.6 | 5 10 47.0 | 140 35 40.8 | 2 21 40.3 | 178 35 9.5 | 1 9 52.3 |
| 9.0 | 94 14 51.2 | 5 3 22.7 | 147 33 1.6 | 1 47 44.2 | 185 14 49.9 | 1 43 32.5 |
| 9.5 | 101 20 35.0 | 4 51 19.9 | 154 27 18.0 | 1 12 28.3 | 191 50 25.4 | 2 15 27.3 |
| 10.0 | 108 26 18.1 | 4 34 49.8 | 161 18 33.4 | 0 36 25.5 | 198 22 14.2 | 2 45 14.8 |
| 10.5 | 115 31 44.9 | 4 14 8.0 | 168 6 52.2 | +0 0 8.2 | 204 50 33.8 | 3 12 36.1 |
| 11.0 | 122 36 41.1 | 3 49 34.6 | 174 52 19.4 | −0 35 52.3 | 211 15 40.5 | 3 37 14.9 |
| 11.5 | 129 40 53.0 | 3 21 33.4 | 181 34 59.6 | 1 11 5.6 | 217 37 48.7 | 3 58 57.2 |
| 12.0 | 136 44 7.6 | 2 50 31.9 | 188 14 56.2 | 1 45 3.4 | 223 57 10.8 | 4 17 31.6 |
| 12.5 | 143 46 11.8 | 2 17 0.9 | 194 52 11.2 | 2 17 19.3 | 230 13 57.1 | 4 32 49.0 |
| 13.0 | 150 46 52.1 | 1 41 33.0 | 201 26 45.2 | 2 47 29.0 | 236 28 16.1 | 4 44 42.8 |
| 13.5 | 157 45 54.0 | 1 4 43.0 | 207 58 36.9 | 3 15 11.0 | 242 40 14.5 | 4 53 8.7 |
| 14.0 | 164 43 2.6 | +0 27 6.5 | 214 27 43.6 | 3 40 6.6 | 248 49 57.5 | 4 58 4.7 |
| 14.5 | 171 38 2.0 | −0 10 40.7 | 220 54 1.9 | 4 2 0.0 | 254 57 29.8 | 4 59 31.2 |
| 15.0 | 178 30 35.1 | 0 48 3.2 | 227 17 27.6 | 4 20 38.4 | 261 2 55.7 | 4 57 30.8 |
| 15.5 | 185 20 25.5 | 1 24 27.1 | 233 37 57.0 | 4 35 52.6 | 267 6 20.2 | 4 52 8.3 |
| 16.0 | 192 7 15.4 | 1 59 20.6 | 239 55 27.1 | 4 47 36.1 | 273 7 49.0 | 4 43 30.2 |
| 16.5 | 198 50 48.4 | 2 32 14.8 | 246 9 56.4 | 4 55 45.5 | 279 7 29.3 | 4 31 44.4 |
| 17.0 | 205 30 49.2 | 3 2 44.0 | 252 21 26.1 | 5 0 20.4 | 285 5 30.2 | 4 17 1.3 |
| 17.5 | 212 7 4.5 | 3 30 26.3 | 258 29 59.7 | 5 1 22.9 | 291 2 3.4 | 3 59 31.8 |
| 18.0 | 218 39 23.7 | 3 55 3.7 | 264 35 43.7 | 4 58 57.2 | 296 57 23.2 | 3 39 28.2 |
| 18.5 | 225 7 39.8 | 4 16 22.1 | 270 38 48.5 | 4 53 9.5 | 302 51 47.1 | 3 17 3.5 |
| 19.0 | 231 31 49.3 | 4 34 11.8 | 276 39 27.9 | 4 44 7.5 | 308 45 35.5 | 2 52 31.7 |
| 19.5 | 237 51 53.4 | 4 48 26.4 | 282 37 59.6 | 4 32 0.4 | 314 39 12.1 | 2 26 7.2 |
| 20.0 | 244 7 57.3 | 4 59 2.3 | 288 34 44.8 | 4 16 58.2 | 320 33 3.8 | 1 58 4.9 |
| 20.5 | 250 20 10.9 | 5 5 59.2 | 294 30 8.4 | 3 59 11.8 | 326 27 40.6 | 1 28 40.2 |
| 21.0 | 256 28 48.5 | 5 9 19.3 | 300 24 38.8 | 3 38 52.8 | 332 23 35.5 | 0 58 9.1 |
| 21.5 | 262 34 8.8 | 5 9 6.6 | 306 18 47.7 | 3 16 12.9 | 338 21 24.0 | −0 26 48.1 |
| 22.0 | 268 36 34.0 | 5 5 26.7 | 312 13 9.6 | 2 51 24.7 | 344 21 44.0 | +0 5 5.6 |
| 22.5 | 274 36 30.0 | 4 58 26.4 | 318 8 21.4 | 2 24 41.2 | 350 25 14.9 | 0 37 13.9 |
| 23.0 | 280 34 26.1 | 4 48 13.6 | 324 5 2.3 | 1 56 15.8 | 356 32 37.5 | 1 9 17.8 |
| 23.5 | 286 30 54.3 | 4 34 56.5 | 330 3 53.0 | 1 26 22.8 | 2 44 32.3 | 1 40 56.7 |
| 24.0 | 292 26 29.0 | 4 18 44.1 | 336 5 34.9 | 0 55 17.5 | 9 1 39.6 | 2 11 48.8 |
| 24.5 | 298 21 46.4 | 3 59 46.1 | 342 10 49.6 | −0 23 16.4 | 15 24 37.6 | 2 41 30.6 |
| 25.0 | 304 17 24.2 | 3 38 12.6 | 348 20 18.2 | +0 9 22.5 | 21 54 1.4 | 3 9 36.9 |
| 25.5 | 310 14 1.1 | 3 14 14.1 | 354 34 40.2 | 0 42 19.4 | 28 30 21.4 | 3 35 40.9 |
| 26.0 | 316 12 16.1 | 2 48 2.3 | 0 54 32.3 | 1 15 12.5 | 35 14 1.6 | 3 59 14.5 |
| 26.5 | 322 12 47.9 | 2 19 49.6 | 7 20 27.3 | 1 47 37.8 | 42 5 17.8 | 4 19 48.7 |
| 27.0 | 328 16 14.1 | 1 49 49.8 | 13 52 53.0 | 2 19 9.1 | 49 4 15.7 | 4 36 54.2 |
| 27.5 | 334 23 11.1 | 1 18 18.3 | 20 32 10.2 | 2 49 17.8 | 56 10 48.9 | 4 50 2.7 |
| 28.0 | 340 34 12.3 | 0 45 32.2 | 27 18 31.5 | 3 17 33.5 | 63 24 38.0 | 4 58 48.1 |
| 28.5 | 346 49 48.8 | −0 11 50.8 | 34 11 59.6 | 3 43 24.6 | 70 45 9.1 | 5 2 48.0 |
| 29.0 | 353 10 26.7 | +0 22 24.2 | 41 12 26.6 | 4 6 18.7 | 78 11 34.8 | 5 1 45.2 |
| 29.5 | 359 36 28.0 | 0 56 48.6 | 48 19 32.3 | 4 25 44.4 | 85 42 55.4 | 4 55 29.9 |
| 30.0 | 6 8 8.5 | 1 30 55.9 | 55 32 44.5 | 4 41 11.8 | 93 17 59.3 | 4 44 0.3 |
| 30.5 | 12 45 37.3 | 2 4 17.3 | 62 51 28.9 | 4 52 14.8 | 100 55 26.8 | 4 27 23.6 |
| 31.0 | 19 28 55.9 | 2 36 22.0 | 70 14 20.7 | 4 58 32.3 | 108 33 54.0 | 4 5 56.7 |
| 31.5 | 26 17 58.0 | +3 6 37.3 | 77 40 46.3 | +4 59 49.6 | 116 11 56.3 | +3 40 5.1 |

# ASTRONOMICAL EPHEMERIS

FOR THE

# MERIDIAN OF WASHINGTON.

| Mean Noon. | Apparent Obliquity. | Equation of Equinoxes. | | Precession of Equinoxes in Longitude. | The Sun's | | Mean Longitude of Moon's Ascending Node. |
|---|---|---|---|---|---|---|---|
| | | In Longitude | In R. A. | | Aberration. | Hor. Parallax. | |
| 1876. | 23° 27′ | | | | | | |
| Jan. 1 | 27″.51 | −0″.51 | −0ˢ.04 | 0″.00 | −20″.80 | 9″.00 | 3° 19′.0 |
| 11 | 27.60 | +0.06 | +0.00 | 1.38 | 20.79 | 9.00 | 2 47.2 |
| 21 | 27.75 | 0.52 | +0.03 | 2.75 | 20.77 | 8.99 | 2 15.4 |
| 31 | 27.92 | 0.84 | +0.05 | 4.13 | 20.74 | 8.98 | 1 43.7 |
| Feb 10 | 28.11 | 0.99 | +0.06 | 5.50 | 20.71 | 8.96 | 1 11.9 |
| 20 | 28.27 | 0.99 | +0.06 | 6.88 | −20.67 | 8.94 | 0 40.1 |
| Mar. 1 | 28.40 | 0.86 | +0.05 | 8.26 | 20.63 | 8.92 | 0 8.3 |
| 11 | 28.48 | 0.63 | +0.04 | 9.63 | 20.57 | 8.90 | 359 36.6 |
| 21 | 28.49 | 0.35 | +0.02 | 11.01 | 20.51 | 8.87 | 359 4.8 |
| 31 | 28.44 | +0.09 | +0.01 | 12.38 | 20.45 | 8.85 | 358 33.0 |
| Apr. 10 | 28.33 | −0.13 | −0.01 | 13.76 | −20.39 | 8.82 | 358 1.3 |
| 20 | 28.16 | 0.25 | −0.02 | 15.14 | 20.34 | 8.80 | 357 29.5 |
| 30 | 27.97 | 0.24 | −0.01 | 16.51 | 20.29 | 8.78 | 356 57.7 |
| May 10 | 27.77 | −0.09 | −0.01 | 17.89 | 20.24 | 8.76 | 356 25.9 |
| 20 | 27.58 | +0.20 | +0.01 | 19.26 | 20.19 | 8.74 | 355 54.2 |
| 30 | 27.42 | +0.60 | +0.04 | 20.64 | −20.16 | 8.72 | 355 22.4 |
| June 9 | 27.30 | 1.09 | +0.07 | 22.02 | 20.13 | 8.71 | 354 50.6 |
| 19 | 27.24 | 1.63 | +0.10 | 23.39 | 20.11 | 8.71 | 354 18.9 |
| 29 | 27.24 | 2.17 | +0.13 | 24.77 | 20.11 | 8.70 | 353 47.1 |
| July 9 | 27.30 | 2.68 | +0.16 | 26.14 | 20.10 | 8.70 | 353 15.3 |
| 19 | 27.41 | 3.11 | +0.19 | 27.52 | −20.12 | 8.71 | 352 43.5 |
| 29 | 27.54 | 3.43 | +0.21 | 28.90 | 20.14 | 8.72 | 352 11.8 |
| Aug. 8 | 27.70 | 3.61 | +0.22 | 30.27 | 20.17 | 8.73 | 351 40.0 |
| 18 | 27.85 | 3.66 | +0.22 | 31.65 | 20.20 | 8.75 | 351 8.2 |
| 28 | 27.98 | 3.58 | +0.22 | 33.02 | 20.24 | 8.77 | 350 36.4 |
| Sept. 7 | 28.07 | 3.40 | +0.21 | 34.40 | −20.29 | 8.79 | 350 4.7 |
| 17 | 28.11 | 3.14 | +0.19 | 35.78 | 20.35 | 8.81 | 349 32.9 |
| 27 | 28.08 | 2.86 | +0.18 | 37.15 | 20.41 | 8.84 | 349 1.1 |
| Oct. 7 | 27.99 | 2.60 | +0.16 | 38.53 | 20.47 | 8.87 | 348 29.4 |
| 17 | 27.83 | 2.42 | +0.15 | 39.90 | 20.53 | 8.88 | 347 57.6 |
| 27 | 27.64 | 2.35 | +0.14 | 41.28 | −20.59 | 8.91 | 347 25.8 |
| Nov. 6 | 27.42 | 2.43 | +0.15 | 42.66 | 20.64 | 8.93 | 346 54.0 |
| 16 | 27.20 | 2.67 | +0.16 | 44.03 | 20.69 | 8.95 | 346 22.3 |
| 26 | 27.00 | 3.06 | +0.19 | 45.41 | 20.73 | 8.97 | 345 50.5 |
| Dec. 6 | 26.84 | 3.57 | +0.22 | 46.78 | −20.76 | 8.98 | 345 18.7 |
| 16 | 26.73 | 4.17 | +0.26 | 48.16 | 20.78 | 8.99 | 344 46.9 |
| 26 | 26.70 | 4.80 | +0.27 | 49.54 | 20.79 | 9.00 | 344 15.2 |
| 36 | 26.74 | + 5.40 | +0.33 | 50.91 | −20.79 | 9.00 | 343 43.6 |

Mean Obliquity, 1876.0, 23° 27′ 18″.92 Motion in 100 days,—0″.1272

| | | | | |
|---|---|---|---|---|
| Precession for 1876.5, . . . | 50″.2584 | Log. | 1.70121 | |
| Precession in a Solar Day, . | 0″.1376 | Log. | 9.13862 | |
| Precession in a Sidereal Day, | 0″.1372 | Log. | 9.13743 | |
| Sun's Mean Hor. Parallax, . | 8″.848 | | | |

**Daily Motion.**

−3′.177

## FOR WASHINGTON MEAN MIDNIGHT.

### LOGARITHMS FOR REDUCTION OF MEAN PLACES, 1876.0, TO APPARENT PLACES.

| Solar day. Sid. hour. | A. | B. | C. | D. | Solar day. Sid. hour. | A. | B. | C. | D. |
|---|---|---|---|---|---|---|---|---|---|
| Jan. 0 | *n*7.9956 | *n*0.9347 | *n*0.5211 | 1.3037 | Mar. 1 | 9.2655 | *n*0.9814 | *n*1.2514 | 0.8002 |
| 1 | 7.7767 | 0.9351 | 0.5620 | 1.3022 | 2 | 9.2710 | 0.9819 | 1.2538 | 0.7761 |
| 2 | *n*7.3160 | 0.9355 | 0.5993 | 1.3006 | 3 | 9.2763 | 0.9824 | 1.2560 | 0.7505 |
| 3 | *p*7.2648 | 0.9359 | 0.6335 | 1.2989 | 4 | 9.2816 | 0.9828 | 1.2581 | 0.7230 |
| h 4 | 7.7589 | 0.9364 | 0.6651 | 1.2970 | h 5 | 9.2868 | 0.9833 | 1.2601 | 0.6937 |
| (7.0) 5 | 7.9836 | 0.9369 | 0.6943 | 1.2949 | (11.0) 6 | 9.2919 | 0.9837 | 1.2619 | 0.6621 |
| 6 | 8.1300 | *n*0.9375 | *n*0.7216 | 1.2928 | 7 | 9.2969 | *n*0.9840 | *n*1.2636 | 0.6278 |
| 7 | 8.2391 | 0.9380 | 0.7472 | 1.2904 | 8 | 9.3018 | 0.9844 | 1.2651 | 0.5906 |
| 8 | 8.3255 | 0.9386 | 0.7712 | 1.2879 | 9 | 9.3067 | 0.9847 | 1.2665 | 0.5497 |
| 9 | 8.3972 | 0.9392 | 0.7938 | 1.2853 | 10 | 9.3114 | 0.9849 | 1.2678 | 0.5044 |
| 10 | 8.4586 | 0.9399 | 0.8152 | 1.2825 | 11 | 9.3161 | 0.9852 | 1.2689 | 0.4537 |
| 11 | 8.5122 | *n*0.9406 | *n*0.8354 | 1.2796 | 12 | 9.3207 | *n*0.9854 | *n*1.2699 | 0.3963 |
| 12 | 8.5593 | 0.9413 | 0.8546 | 1.2764 | 13 | 9.3253 | 0.9856 | 1.2707 | 0.3299 |
| 13 | 8.6017 | 0.9420 | 0.8728 | 1.2732 | 14 | 9.3298 | 0.9858 | 1.2715 | 0.2513 |
| 14 | 8.6402 | 0.9427 | 0.8902 | 1.2697 | 15 | 9.3342 | 0.9859 | 1.2721 | 0.1553 |
| 15 | 8.6753 | 0.9435 | 0.9068 | 1.2662 | 16 | 9.3386 | 0.9860 | 1.2725 | 0.0317 |
| 16 | 8.7075 | *n*0.9443 | *n*0.9226 | 1.2624 | 17 | 9.3429 | *n*0.9861 | *n*1.2729 | 9.8582 |
| 17 | 8.7373 | 0.9451 | 0.9378 | 1.2585 | 18 | 9.3472 | 0.9861 | 1.2731 | 9.5649 |
| 18 | 8.7649 | 0.9459 | 0.9523 | 1.2544 | 19 | 9.3515 | 0.9861 | 1.2731 | *p*8.1173 |
| h 19 | 8.7907 | 0.9467 | 0.9662 | 1.2501 | h 20 | 9.3557 | 0.9861 | 1.2731 | *n*9.5326 |
| (8.0) 20 | 8.8150 | 0.9476 | 0.9795 | 1.2456 | (12.0) 21 | 9.3598 | 0.9860 | 1.2729 | 9.8416 |
| 21 | 8.8377 | *n*0.9485 | *n*0.9923 | 1.2410 | 22 | 9.3640 | *n*0.9860 | *n*1.2726 | *n*0.0203 |
| 22 | 8.8591 | 0.9493 | 1.0046 | 1.2361 | 23 | 9.3681 | 0.9859 | 1.2721 | 0.1464 |
| 23 | 8.8794 | 0.9502 | 1.0164 | 1.2311 | 24 | 9.3721 | 0.9857 | 1.2715 | 0.2438 |
| 24 | 8.8986 | 0.9511 | 1.0278 | 1.2259 | 25 | 9.3762 | 0.9856 | 1.2708 | 0.3232 |
| 25 | 8.9168 | 0.9520 | 1.0387 | 1.2204 | 26 | 9.3802 | 0.9854 | 1.2700 | 0.3901 |
| 26 | 8.9341 | *n*0.9530 | *n*1.0493 | 1.2148 | 27 | 9.3841 | *n*0.9852 | *n*1.2690 | *n*0.4479 |
| 27 | 8.9506 | 0.9539 | 1.0594 | 1.2090 | 28 | 9.3881 | 0.9849 | 1.2679 | 0.4988 |
| 28 | 8.9663 | 0.9548 | 1.0692 | 1.2029 | 29 | 9.3920 | 0.9846 | 1.2667 | 0.5442 |
| 29 | 8.9814 | 0.9557 | 1.0787 | 1.1966 | 30 | 9.3960 | 0.9843 | 1.2653 | 0.5852 |
| 30 | 8.9958 | 0.9567 | 1.0878 | 1.1901 | 31 | 9.3999 | 0.9840 | 1.2638 | 0.6225 |
| 31 | 9.0097 | 0.9576 | 1.0965 | 1.1834 | Apr. 1 | 9.4038 | 0.9836 | 1.2622 | 0.6566 |
| Feb. 1 | 9.0228 | *n*0.9586 | *n*1.1050 | 1.1764 | 2 | 9.4077 | *n*0.9832 | *n*1.2604 | *n*0.6882 |
| 2 | 9.0356 | 0.9595 | 1.1132 | 1.1691 | 3 | 9.4115 | 0.9828 | 1.2585 | 0.7175 |
| h 3 | 9.0479 | 0.9604 | 1.1210 | 1.1617 | h 4 | 9.4154 | 0.9824 | 1.2565 | 0.7448 |
| (9.0) 4 | 9.0596 | 0.9614 | 1.1286 | 1.1539 | (13.0) 5 | 9.4192 | 0.9819 | 1.2543 | 0.7703 |
| 5 | 9.0710 | 0.9623 | 1.1360 | 1.1458 | 6 | 9.4231 | 0.9814 | 1.2520 | 0.7943 |
| 6 | 9.0820 | *n*0.9632 | *n*1.1431 | 1.1375 | 7 | 9.4269 | *n*0.9809 | *n*1.2595 | *n*0.8169 |
| 7 | 9.0925 | 0.9642 | 1.1499 | 1.1289 | 8 | 9.4308 | 0.9804 | 1.2469 | 0.8383 |
| 8 | 9.1028 | 0.9651 | 1.1565 | 1.1200 | 9 | 9.4346 | 0.9798 | 1.2442 | 0.8585 |
| 9 | 9.1126 | 0.9660 | 1.1628 | 1.1107 | 10 | 9.4384 | 0.9792 | 1.2413 | 0.8777 |
| 10 | 9.1222 | 0.9669 | 1.1689 | 1.1011 | 11 | 9.4422 | 0.9786 | 1.2383 | 0.8959 |
| 11 | 9.1314 | *n*0.9678 | *n*1.1748 | 1.0912 | 12 | 9.4460 | *n*0.9780 | *n*1.2352 | *n*0.9133 |
| 12 | 9.1404 | 0.9686 | 1.1805 | 1.0809 | 13 | 9.4499 | 0.9774 | 1.2318 | 0.9299 |
| 13 | 9.1491 | 0.9695 | 1.1860 | 1.0702 | 14 | 9.4537 | 0.9767 | 1.2283 | 0.9457 |
| 14 | 9.1576 | 0.9703 | 1.1913 | 1.0591 | 15 | 9.4575 | 0.9760 | 1.2247 | 0.9609 |
| 15 | 9.1657 | 0.9712 | 1.1964 | 1.0475 | 16 | 9.4613 | 0.9753 | 1.2210 | 0.9754 |
| 16 | 9.1736 | *n*0.9720 | *n*1.2013 | 1.0356 | 17 | 9.4652 | *n*0.9746 | *n*1.2171 | *n*0.9893 |
| 17 | 9.1814 | 0.9728 | 1.2059 | 1.0231 | 18 | 9.4690 | 0.9739 | 1.2130 | 1.0026 |
| 18 | 9.1889 | 0.9736 | 1.2105 | 1.0102 | h 19 | 9.4728 | 0.9731 | 1.2087 | 1.0155 |
| h 19 | 9.1962 | 0.9744 | 1.2148 | 0.9967 | (14.0) 20 | 9.4766 | 0.9724 | 1.2042 | 1.0278 |
| (10.0) 20 | 9.2033 | 0.9751 | 1.2189 | 0.9827 | 21 | 9.4804 | 0.9716 | 1.1996 | 1.0397 |
| 21 | 9.2102 | *n*0.9758 | *n*1.2229 | 0.9680 | 22 | 9.4842 | *n*0.9708 | *n*1.1949 | *n*1.0511 |
| 22 | 9.2170 | 0.9766 | 1.2267 | 0.9527 | 23 | 9.4881 | 0.9700 | 1.1899 | 1.0621 |
| 23 | 9.2236 | 0.9772 | 1.2303 | 0.9368 | 24 | 9.4919 | 0.9692 | 1.1848 | 1.0727 |
| 24 | 9.2300 | 0.9779 | 1.2338 | 0.9200 | 25 | 9.4958 | 0.9683 | 1.1795 | 1.0829 |
| 25 | 9.2362 | 0.9786 | 1.2372 | 0.9025 | 26 | 9.4996 | 0.9675 | 1.1740 | 1.0927 |
| 26 | 9.2423 | *n*0.9792 | *n*1.2403 | 0.8841 | 27 | 9.5035 | *n*0.9666 | *n*1.1683 | *n*1.1022 |
| 27 | 9.2483 | 0.9798 | 1.2433 | 0.8648 | 28 | 9.5073 | 0.9658 | 1.1624 | 1.1114 |
| 28 | 9.2542 | 0.9804 | 1.2462 | 0.8444 | 29 | 9.5112 | 0.9649 | 1.1562 | 1.1203 |
| 29 | 9.2599 | 0.9809 | 1.2488 | 0.8230 | 30 | 9.5151 | 0.9640 | 1.1499 | 1.1288 |
| 30 | 9.2655 | *n*0.9814 | *n*1.2514 | 0.8002 | 31 | 9.5189 | *n*0.9632 | *n*1.1434 | *n*1.1371 |

Jan. 0 to June 22, E = 0″.00.

## FOR WASHINGTON MEAN MIDNIGHT.

### LOGARITHMS FOR REDUCTION OF MEAN PLACES, 1876.0, TO APPARENT PLACES.

| Solar day. Sid. hour. | A. | B. | C. | D. | Solar day. Sid. hour. | A. | B. | C. | D. |
|---|---|---|---|---|---|---|---|---|---|
| May 1 | 9.5189 | n0.9632 | n1.1434 | n1.1371 | July 1 | 9.7383 | n0.9339 | 0.5377 | n1.3031 |
| 2 | 9.5228 | 0.9623 | 1.1366 | 1.1451 | 2 | 9.7413 | 0.9342 | 0.5746 | 1.3017 |
| 3 | 9.5266 | 0.9614 | 1.1297 | 1.1528 | 3 | 9.7442 | 0.9345 | 0.6086 | 1.3002 |
| 4 | 9.5305 | 0.9605 | 1.1224 | 1.1603 | 4 | 9.7471 | 0.9349 | 0.6400 | 1.2985 |
| h 5 | 9.5344 | 0.9596 | 1.1150 | 1.1675 | h 5 | 9.7500 | 0.9353 | 0.6691 | 1.2967 |
| (15.0) 6 | 9.5382 | n0.9587 | n1.1073 | n1.1744 | (19.0) 6 | 9.7529 | n0.9357 | 0.6963 | n1.2948 |
| 7 | 9.5421 | 0.9578 | 1.0993 | 1.1811 | 7 | 9.7557 | 0.9361 | 0.7217 | 1.2927 |
| 8 | 9.5460 | 0.9570 | 1.0910 | 1.1876 | 8 | 9.7585 | 0.9365 | 0.7457 | 1.2906 |
| 9 | 9.5498 | 0.9561 | 1.0825 | 1.1939 | 9 | 9.7613 | 0.9370 | 0.7683 | 1.2883 |
| 10 | 9.5537 | 0.9552 | 1.0737 | 1.2000 | 10 | 9.7640 | 0.9375 | 0.7896 | 1.2858 |
| 11 | 9.5576 | n0.9543 | n1.0646 | n1.2059 | 11 | 9.7668 | n0.9380 | 0.8099 | n1.2832 |
| 12 | 9.5614 | 0.9534 | 1.0551 | 1.2115 | 12 | 9.7694 | 0.9385 | 0.8291 | 1.2805 |
| 13 | 9.5653 | 0.9526 | 1.0453 | 1.2170 | 13 | 9.7721 | 0.9391 | 0.8474 | 1.2776 |
| 14 | 9.5692 | 0.9517 | 1.0352 | 1.2222 | 14 | 9.7747 | 0.9397 | 0.8649 | 1.2746 |
| 15 | 9.5730 | 0.9509 | 1.0247 | 1.2273 | 15 | 9.7773 | 0.9403 | 0.8816 | 1.2715 |
| 16 | 9.5768 | n0.9500 | n1.0139 | n1.2322 | 16 | 9.7799 | n0.9409 | 0.8975 | n1.2682 |
| 17 | 9.5807 | 0.9492 | 1.0026 | 1.2369 | 17 | 9.7824 | 0.9415 | 0.9127 | 1.2648 |
| 18 | 9.5845 | 0.9484 | 0.9909 | 1.2415 | 18 | 9.7849 | 0.9422 | 0.9274 | 1.2612 |
| 19 | 9.5884 | 0.9476 | 0.9788 | 1.2459 | 19 | 9.7874 | 0.9428 | 0.9414 | 1.2575 |
| h 20 | 9.5922 | 0.9468 | 0.9662 | 1.2501 | h 20 | 9.7898 | 0.9435 | 0.9549 | 1.2536 |
| (16.0) 21 | 9.5960 | n0.9460 | n0.9530 | n1.2541 | (20.0) 21 | 9.7922 | n0.9442 | 0.9678 | n1.2495 |
| 22 | 9.5998 | 0.9452 | 0.9394 | 1.2580 | 22 | 9.7946 | 0.9450 | 0.9803 | 1.2453 |
| 23 | 9.6036 | 0.9444 | 0.9252 | 1.2617 | 23 | 9.7970 | 0.9457 | 0.9923 | 1.2410 |
| 24 | 9.6074 | 0.9437 | 0.9104 | 1.2653 | 24 | 9.7993 | 0.9464 | 1.0038 | 1.2364 |
| 25 | 9.6111 | 0.9430 | 0.8950 | 1.2687 | 25 | 9.8016 | 0.9472 | 1.0150 | 1.2317 |
| 26 | 9.6149 | n0.9423 | n0.8788 | n1.2720 | 26 | 9.8039 | n0.9479 | 1.0257 | n1.2268 |
| 27 | 9.6187 | 0.9416 | 0.8620 | 1.2752 | 27 | 9.8061 | 0.9487 | 1.0361 | 1.2218 |
| 28 | 9.6224 | 0.9410 | 0.8443 | 1.2781 | 28 | 9.8083 | 0.9495 | 1.0461 | 1.2165 |
| 29 | 9.6262 | 0.9403 | 0.8258 | 1.2810 | 29 | 9.8105 | 0.9502 | 1.0558 | 1.2111 |
| 30 | 9.6299 | 0.9397 | 0.8063 | 1.2837 | 30 | 9.8127 | 0.9510 | 1.0652 | 1.2055 |
| 31 | 9.6336 | 0.9391 | 0.7857 | 1.2863 | 31 | 9.8148 | 0.9518 | 1.0742 | 1.1997 |
| June 1 | 9.6373 | n0.9385 | n0.7640 | n1.2887 | Aug. 1 | 9.8169 | n0.9526 | 1.0829 | n1.1936 |
| 2 | 9.6409 | 0.9380 | 0.7411 | 1.2910 | 2 | 9.8189 | 0.9534 | 1.0914 | 1.1874 |
| 3 | 9.6446 | 0.9375 | 0.7168 | 1.2932 | 3 | 9.8210 | 0.9542 | 1.0996 | 1.1809 |
| h 4 | 9.6482 | 0.9370 | 0.6909 | 1.2952 | h 4 | 9.8230 | 0.9550 | 1.1074 | 1.1743 |
| (17.0) 5 | 9.6518 | 0.9365 | 0.6633 | 1.2971 | (21.0) 5 | 9.8250 | 0.9558 | 1.1151 | 1.1674 |
| 6 | 9.6555 | n0.9360 | n0.6336 | n1.2989 | 6 | 9.8270 | n0.9566 | 1.1225 | n1.1602 |
| 7 | 9.6590 | 0.9356 | 0.6016 | 1.3005 | 7 | 9.8289 | 0.9574 | 1.1296 | 1.1528 |
| 8 | 9.6626 | 0.9352 | 0.5670 | 1.3020 | 8 | 9.8308 | 0.9582 | 1.1365 | 1.1452 |
| 9 | 9.6662 | 0.9348 | 0.5293 | 1.3034 | 9 | 9.8327 | 0.9590 | 1.1432 | 1.1373 |
| 10 | 9.6697 | 0.9345 | 0.4879 | 1.3047 | 10 | 9.8345 | 0.9598 | 1.1497 | 1.1291 |
| 11 | 9.6732 | n0.9342 | n0.4419 | n1.3058 | 11 | 9.8363 | n0.9606 | 1.1559 | n1.1207 |
| 12 | 9.6767 | 0.9339 | 0.3903 | 1.3068 | 12 | 9.8382 | 0.9614 | 1.1620 | 1.1119 |
| 13 | 9.6801 | 0.9336 | 0.3317 | 1.3077 | 13 | 9.8399 | 0.9622 | 1.1679 | 1.1028 |
| 14 | 9.6836 | 0.9334 | 0.2638 | 1.3085 | 14 | 9.8417 | 0.9630 | 1.1735 | 1.0934 |
| 15 | 9.6870 | 0.9332 | 0.1832 | 1.3092 | 15 | 9.8434 | 0.9637 | 1.1790 | 1.0837 |
| 16 | 9.6904 | n0.9330 | n0.0839 | n1.3097 | 16 | 9.8451 | n0.9645 | 1.1843 | n1.0736 |
| 17 | 9.6938 | 0.9329 | 9.9548 | 1.3101 | 17 | 9.8468 | 0.9652 | 1.1894 | 1.0632 |
| 18 | 9.6971 | 0.9327 | 9.7702 | 1.3104 | 18 | 9.8485 | 0.9659 | 1.1943 | 1.0524 |
| h 19 | 9.7004 | 0.9327 | n9.4420 | 1.3106 | h 19 | 9.8501 | 0.9667 | 1.1990 | 1.0411 |
| (18.0) 20 | 9.7037 | 0.9326 | p8.5514 | 1.3106 | (22.0) 20 | 9.8517 | 0.9674 | 1.2036 | 1.0294 |
| 21 | 9.7070 | n0.9326 | 9.5413 | n1.3105 | 21 | 9.8533 | n0.9680 | 1.2080 | n1.0173 |
| 22 | 9.7103 | 0.9326 | 9.8193 | 1.3103 | 22 | 9.8549 | 0.9687 | 1.2123 | 1.0047 |
| 23 | 9.7135 | 0.9326 | 9.9876 | 1.3100 | 23 | 9.8565 | 0.9694 | 1.2163 | 0.9916 |
| 24 | 9.7167 | 0.9327 | 0.1085 | 1.3096 | 24 | 9.8580 | 0.9700 | 1.2203 | 0.9779 |
| 25 | 9.7198 | 0.9328 | 0.2027 | 1.3090 | 25 | 9.8596 | 0.9706 | 1.2240 | 0.9637 |
| 26 | 9.7230 | n0.9329 | 0.2800 | n1.3083 | 26 | 9.8611 | n0.9713 | 1.2276 | n0.9488 |
| 27 | 9.7261 | 0.9330 | 0.3455 | 1.3075 | 27 | 9.8625 | 0.9718 | 1.2311 | 0.9333 |
| 28 | 9.7292 | 0.9332 | 0.4024 | 1.3066 | 28 | 9.8640 | 0.9724 | 1.2344 | 0.9171 |
| 29 | 9.7322 | 0.9334 | 0.4525 | 1.3056 | 29 | 9.8655 | 0.9730 | 1.2376 | 0.9001 |
| 30 | 9.7353 | 0.9337 | 0.4973 | 1.3044 | 30 | 9.8669 | 0.9735 | 1.2406 | 0.8823 |
| 31 | 9.7383 | n0.9339 | 0.5377 | n1.3031 | 31 | 9.8683 | n 0.9740 | 1.2435 | n0.8636 |

June 23 to Dec. 32, E = + 0''.01.

## FOR WASHINGTON MEAN MIDNIGHT.

### LOGARITHMS FOR REDUCTION OF MEAN PLACES, 1876.0, TO APPARENT PLACES.

| Solar day. Sid. hour. | A. | B. | C. | D. | Solar day. Sid. hour. | A. | B. | C. | D. |
|---|---|---|---|---|---|---|---|---|---|
| Sept. 1 | 9.8697 | *n*0.9745 | 1.2462 | *n*0.8439 | Nov. 1 | 9.9472 | *n*0.9545 | 1.1564 | 1.1201 |
| 2 | 9.8711 | 0.9750 | 1.2488 | 0.8231 | h 2 | 9.9486 | 0.9534 | 1.1499 | 1.1289 |
| h 3 | 9.8725 | 0.9754 | 1.2513 | 0.8011 | (3.0) 3 | 9.9501 | 0.9524 | 1.1431 | 1.1375 |
| (23.0) 4 | 9.8738 | 0.9758 | 1.2536 | 0.7779 | 4 | 9.9515 | 0.9514 | 1.1361 | 1.1457 |
| 5 | 9.8752 | 0.9762 | 1.2558 | 0.7531 | 5 | 9.9530 | 0.9504 | 1.1288 | 1.1537 |
| 6 | 9.8765 | *n*0.9766 | 1.2579 | *n*0.7268 | 6 | 9.9545 | *n*0.9494 | 1.1213 | 1.1614 |
| 7 | 9.8778 | 0.9769 | 1.2598 | 0.6985 | 7 | 9.9560 | 0.9483 | 1.1135 | 1.1688 |
| 8 | 9.8791 | 0.9773 | 1.2616 | 0.6682 | 8 | 9.9575 | 0.9473 | 1.1054 | 1.1760 |
| 9 | 9.8804 | 0.9776 | 1.2632 | 0.6354 | 9 | 9.9590 | 0.9463 | 1.0970 | 1.1830 |
| 10 | 9.8817 | 0.9778 | 1.2648 | 0.5998 | 10 | 9.9605 | 0.9452 | 1.0883 | 1.1897 |
| 11 | 9.8830 | *n*0.9780 | 1.2662 | *n*0.5608 | 11 | 9.9620 | *n*0.9442 | 1.0794 | 1.1961 |
| 12 | 9.8842 | 0.9783 | 1.2674 | 0.5178 | 12 | 9.9635 | 0.9432 | 1.0700 | 1.2024 |
| 13 | 9.8855 | 0.9785 | 1.2686 | 0.4700 | 13 | 9.9651 | 0.9421 | 1.0603 | 1.2084 |
| 14 | 9.8867 | 0.9786 | 1.2696 | 0.4160 | 14 | 9.9666 | 0.9411 | 1.0503 | 1.2143 |
| 15 | 9.8880 | 0.9787 | 1.2705 | 0.3542 | 15 | 9.9682 | 0.9401 | 1.0399 | 1.2199 |
| 16 | 9.8892 | *n*0.9788 | 1.2712 | *n*0.2819 | 16 | 9.9698 | *n*0.9391 | 1.0290 | 1.2253 |
| 17 | 9.8905 | 0.9789 | 1.2718 | 0.1948 | 17 | 9.9713 | 0.9381 | 1.0178 | 1.2305 |
| 18 | 9.8917 | 0.9790 | 1.2724 | 0.0856 | h 18 | 9.9729 | 0.9371 | 1.0061 | 1.2355 |
| h 19 | 9.8929 | 0.9790 | 1.2727 | 9.9391 | (4.0) 19 | 9.9745 | 0.9361 | 0.9939 | 1.2403 |
| (0.0) 20 | 9.8941 | 0.9790 | 1.2730 | 9.7161 | 20 | 9.9761 | 0.9351 | 0.9813 | 1.2450 |
| 21 | 9.8953 | *n*0.9790 | 1.2731 | *n*9.2317 | 21 | 9.9777 | *n*0.9342 | 0.9681 | 1.2494 |
| 22 | 9.8965 | 0.9789 | 1.2731 | *p*9.2533 | 22 | 9.9793 | 0.9332 | 0.9544 | 1.2537 |
| 23 | 9.8977 | 0.9788 | 1.2730 | 9.7234 | 23 | 9.9810 | 0.9323 | 0.9401 | 1.2578 |
| 24 | 9.8989 | 0.9787 | 1.2727 | 9.9439 | 24 | 9.9826 | 0.9314 | 0.9251 | 1.2618 |
| 25 | 9.9001 | 0.9785 | 1.2724 | 0.0893 | 25 | 9.9842 | 0.9305 | 0.9095 | 1.2655 |
| 26 | 9.9013 | *n*0.9783 | 1.2719 | 0.1981 | 26 | 9.9859 | *n*0.9296 | 0.8931 | 1.2691 |
| 27 | 9.9025 | 0.9781 | 1.2712 | 0.2850 | 27 | 9.9875 | 0.9288 | 0.8760 | 1.2726 |
| 28 | 9.9037 | 0.9778 | 1.2704 | 0.3573 | 28 | 9.9891 | 0.9280 | 0.8580 | 1.2759 |
| 29 | 9.9049 | 0.9776 | 1.2695 | 0.4191 | 29 | 9.9908 | 0.9272 | 0.8391 | 1.2790 |
| 30 | 9.9061 | 0.9773 | 1.2685 | 0.4732 | 30 | 9.9925 | 0.9264 | 0.8191 | 1.2820 |
| Oct. 1 | 9.9073 | *n*0.9769 | 1.2673 | 0.5211 | Dec. 1 | 9.9941 | *n*0.9256 | 0.7981 | 1.2848 |
| 2 | 9.9084 | 0.9766 | 1.2660 | 0.5643 | 2 | 9.9958 | 0.9249 | 0.7758 | 1.2874 |
| 3 | 9.9096 | 0.9762 | 1.2646 | 0.6034 | 3 | 9.9974 | 0.9242 | 0.7522 | 1.2899 |
| h 4 | 9.9109 | 0.9758 | 1.2631 | 0.6391 | h 4 | 9.9991 | 0.9235 | 0.7270 | 1.2923 |
| (1.0) 5 | 9.9121 | 0.9753 | 1.2613 | 0.6721 | (5.0) 5 | 0.0008 | 0.9229 | 0.7002 | 1.2945 |
| 6 | 9.9133 | *n*0.9748 | 1.2595 | 0.7026 | 6 | 0.0024 | *n*0.9223 | 0.6714 | 1.2966 |
| 7 | 9.9145 | 0.9743 | 1.2575 | 0.7310 | 7 | 0.0041 | 0.9217 | 0.6405 | 1.2985 |
| 8 | 9.9157 | 0.9738 | 1.2554 | 0.7576 | 8 | 0.0058 | 0.9211 | 0.6070 | 1.3002 |
| 9 | 9.9169 | 0.9733 | 1.2532 | 0.7825 | 9 | 0.0074 | 0.9206 | 0.5706 | 1.3019 |
| 10 | 9.9181 | 0.9727 | 1.2508 | 0.8060 | 10 | 0.0091 | 0.9201 | 0.5306 | 1.3034 |
| 11 | 9.9194 | *n*0.9721 | 1.2482 | 0.8281 | 11 | 0.0108 | *n*0.9196 | 0.4865 | 1.3047 |
| 12 | 9.9206 | 0.9714 | 1.2455 | 0.8491 | 12 | 0.0124 | 0.9192 | 0.4371 | 1.3059 |
| 13 | 9.9219 | 0.9708 | 1.2427 | 0.8690 | 13 | 0.0141 | 0.9188 | 0.3813 | 1.3070 |
| 14 | 9.9231 | 0.9701 | 1.2397 | 0.8879 | 14 | 0.0158 | 0.9184 | 0.3170 | 1.3079 |
| 15 | 9.9244 | 0.9694 | 1.2365 | 0.9059 | 15 | 0.0174 | 0.9181 | 0.2414 | 1.3087 |
| 16 | 9.9257 | *n*0.9687 | 1.2332 | 0.9231 | 16 | 0.0191 | *n*0.9178 | 0.1496 | 1.3094 |
| 17 | 9.9269 | 0.9679 | 1.2298 | 0.9395 | 17 | 0.0207 | 0.9176 | 0.0329 | 1.3099 |
| 18 | 9.9282 | 0.9671 | 1.2261 | 0.9552 | 18 | 0.0224 | 0.9174 | 9.8724 | 1.3102 |
| h 19 | 9.9295 | 0.9664 | 1.2223 | 0.9702 | h 19 | 0.0240 | 0.9172 | 9.6151 | 1.3105 |
| (2.0) 20 | 9.9308 | 0.9655 | 1.2184 | 0.9846 | (6.0) 20 | 0.0256 | 0.9170 | *p*8.8954 | 1.3106 |
| 21 | 9.9321 | *n*0.9647 | 1.2143 | 0.9984 | 21 | 0.0273 | *n*0.9169 | *n*9.4064 | 1.3106 |
| 22 | 9.9334 | 0.9638 | 1.2100 | 1.0117 | 22 | 0.0289 | 0.9168 | 9.7697 | 1.3104 |
| 23 | 9.9348 | 0.9630 | 1.2055 | 1.0244 | 23 | 0.0305 | 0.9168 | 9.9647 | 1.3101 |
| 24 | 9.9361 | 0.9621 | 1.2008 | 1.0367 | 24 | 0.0321 | 0.9168 | 0.0986 | 1.3096 |
| 25 | 9.9375 | 0.9612 | 1.1960 | 1.0485 | 25 | 0.0337 | 0.9168 | 0.2007 | 1.3090 |
| 26 | 9.9388 | 0.9603 | 1.1909 | 1.0599 | 26 | 0.0353 | 0.9169 | 0.2833 | 1.3083 |
| 27 | 9.9402 | *n*0.9593 | 1.1857 | 1.0708 | 27 | 0.0369 | *n*0.9170 | *n*0.3524 | 1.3074 |
| 28 | 9.9416 | 0.9584 | 1.1803 | 1.0814 | 28 | 0.0385 | 0.9172 | 0.4120 | 1.3064 |
| 29 | 9.9430 | 0.9574 | 1.1746 | 1.0916 | 29 | 0.0400 | 0.9173 | 0.4642 | 1.3053 |
| 30 | 9.9444 | 0.9564 | 1.1688 | 1.1014 | 30 | 0.0416 | 0.9176 | 0.5107 | 1.3040 |
| 31 | 9.9458 | 0.9554 | 1.1627 | 1.1109 | 31 | 0.0431 | 0.9178 | 0.5526 | 1.3026 |
| 32 | 9.9472 | *n*0.9545 | 1.1564 | 1.1201 | 32 | 0.0447 | *n*0.9181 | *n*0.5906 | 1.3010 |

June 23 to Dec. 32, E = + 0″.01.

## FOR WASHINGTON MEAN MIDNIGHT.

### QUANTITIES FOR REDUCING MEAN PLACES, 1876.0, TO APPARENT PLACES.

| Solar day. Sid. hour. | τ. | *f*. | Log *g*. | G. | Log *h*. | H. | Log *i*. | *i*. | *f*. | G. | H. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | y | " | | ° ' | | ° ' | | " | s | h m | h m |
| Jan. 0 | 0.0006 | − 0.46 | 0.9348 | 268 41 | 1.3095 | 350 38 | *n*0.1587 | −1.44 | −0.031 | 17 54.7 | 23 22.5 |
| 1 | .0033 | 0.28 | 0.9351 | 269 12 | 1.3093 | 349 42 | 0.1995 | 1.58 | 0.019 | 17 56.8 | 23 18.8 |
| 2 | .0061 | − 0.10 | 0.9355 | 269 44 | 1.3090 | 348 45 | 0.2368 | 1.73 | −0.007 | 17 58.9 | 23 15.0 |
| 3 | .0088 | + 0.08 | 0.9359 | 270 15 | 1.3088 | 347 48 | 0.2709 | 1.87 | +0.006 | 18 1.0 | 23 11.2 |
| h 4 | .0115 | 0.26 | 0.9364 | 270 46 | 1.3085 | 346 52 | 0.3023 | 2.01 | 0.018 | 18 3.1 | 23 7.5 |
| (7.0) 5 | .0143 | 0.44 | 0.9370 | 271 17 | 1.3082 | 345 55 | 0.3316 | 2.15 | 0.030 | 18 5.1 | 23 3.7 |
| 6 | .0170 | 0.62 | 0.9377 | 271 47 | 1.3079 | 344 58 | *n*0.3591 | −2.29 | +0.042 | 18 7.2 | 22 59.9 |
| 7 | .0198 | 0.80 | 0.9384 | 272 18 | 1.3075 | 344 2 | 0.3847 | 2.43 | 0.053 | 18 9.2 | 22 56.1 |
| 8 | .0225 | 0.98 | 0.9391 | 272 48 | 1.3072 | 343 5 | 0.4086 | 2.56 | 0.065 | 18 11.2 | 22 52.3 |
| 9 | .0252 | 1.15 | 0.9400 | 273 18 | 1.3068 | 342 8 | 0.4312 | 2.70 | 0.077 | 18 13.2 | 22 48.5 |
| 10 | .0280 | 1.33 | 0.9408 | 273 47 | 1.3064 | 341 11 | 0.4526 | 2.84 | 0.088 | 18 15.2 | 22 44.7 |
| 11 | .0307 | 1.50 | 0.9418 | 274 17 | 1.3060 | 340 13 | *n*0.4728 | −2.97 | +0.100 | 18 17.1 | 22 40.9 |
| 12 | .0334 | 1.67 | 0.9428 | 274 46 | 1.3055 | 339 16 | 0.4921 | 3.11 | 0.111 | 18 19.0 | 22 37.1 |
| 13 | .0362 | 1.84 | 0.9438 | 275 14 | 1.3051 | 338 19 | 0.5104 | 3.24 | 0.123 | 18 20.9 | 22 33.2 |
| 14 | .0389 | 2.01 | 0.9449 | 275 42 | 1.3046 | 337 21 | 0.5278 | 3.37 | 0.134 | 18 22.8 | 22 29.4 |
| 15 | .0417 | 2.18 | 0.9460 | 276 10 | 1.3041 | 336 23 | 0.5443 | 3.50 | 0.146 | 18 24.7 | 22 25.6 |
| 16 | .0444 | 2.35 | 0.9472 | 276 38 | 1.3036 | 335 26 | *n*0.5602 | −3.63 | +0.157 | 18 26.5 | 22 21.7 |
| 17 | .0471 | 2.52 | 0.9484 | 277 5 | 1.3031 | 334 28 | 0.5753 | 3.76 | 0.168 | 18 28.3 | 22 17.8 |
| 18 | .0499 | 2.68 | 0.9497 | 277 32 | 1.3026 | 333 30 | 0.5897 | 3.89 | 0.179 | 18 30.1 | 22 14.0 |
| h 19 | .0526 | 2.85 | 0.9509 | 277 58 | 1.3021 | 332 31 | 0.6036 | 4.01 | 0.190 | 18 31.9 | 22 10.1 |
| (8.0) 20 | .0553 | 3.01 | 0.9523 | 278 24 | 1.3015 | 331 33 | 0.6169 | 4.14 | 0.201 | 18 33.6 | 22 6.2 |
| 21 | .0581 | 3.17 | 0.9536 | 278 50 | 1.3009 | 330 34 | *n*0.6297 | −4.26 | +0.212 | 18 35.3 | 22 2.3 |
| 22 | .0608 | 3.33 | 0.9550 | 279 15 | 1.3004 | 329 36 | 0.6421 | 4.39 | 0.222 | 18 37.0 | 21 58.4 |
| 23 | .0636 | 3.49 | 0.9564 | 279 40 | 1.2998 | 328 37 | 0.6539 | 4.51 | 0.233 | 18 38.7 | 21 54.5 |
| 24 | .0663 | 3.65 | 0.9579 | 280 5 | 1.2992 | 327 38 | 0.6652 | 4.63 | 0.243 | 18 40.3 | 21 50.6 |
| 25 | .0690 | 3.81 | 0.9593 | 280 29 | 1.2986 | 326 39 | 0.6761 | 4.74 | 0.254 | 18 41.9 | 21 46.6 |
| 26 | .0718 | 3.96 | 0.9608 | 280 52 | 1.2980 | 325 40 | *n*0.6866 | −4.86 | +0.264 | 18 43.5 | 21 42.7 |
| 27 | .0745 | 4.11 | 0.9623 | 281 15 | 1.2973 | 324 41 | 0.6968 | 4.98 | 0.274 | 18 45.0 | 21 38.7 |
| 28 | .0772 | 4.27 | 0.9638 | 281 38 | 1.2967 | 323 41 | 0.7065 | 5.09 | 0.284 | 18 46.6 | 21 34.7 |
| 29 | .0800 | 4.42 | 0.9654 | 282 1 | 1.2961 | 322 41 | 0.7160 | 5.20 | 0.294 | 18 48.0 | 21 30.8 |
| 30 | .0827 | 4.57 | 0.9669 | 282 23 | 1.2954 | 321 41 | 0.7252 | 5.31 | 0.304 | 18 49.5 | 21 26.8 |
| 31 | .0855 | 4.71 | 0.9684 | 282 44 | 1.2948 | 320 41 | 0.7340 | 5.42 | 0.314 | 18 51.0 | 21 22.8 |
| Feb. 1 | .0882 | 4.86 | 0.9700 | 283 6 | 1.2941 | 319 41 | *n*0.7424 | −5.53 | +0.324 | 18 52.4 | 21 18.8 |
| 2 | .0909 | 5.00 | 0.9716 | 283 26 | 1.2935 | 318 41 | 0.7505 | 5.63 | 0.334 | 18 53.8 | 21 14.7 |
| h 3 | .0937 | 5.15 | 0.9731 | 283 47 | 1.2928 | 317 41 | 0.7584 | 5.73 | 0.343 | 18 55.1 | 21 10.7 |
| (9.0) 4 | .0964 | 5.29 | 0.9747 | 284 7 | 1.2921 | 316 40 | 0.7660 | 5.83 | 0.353 | 18 56.5 | 21 6.7 |
| 5 | .0992 | 5.43 | 0.9762 | 284 27 | 1.2915 | 315 39 | 0.7733 | 5.93 | 0.362 | 18 57.8 | 21 2.6 |
| 6 | .1019 | 5.57 | 0.9778 | 284 46 | 1.2908 | 314 38 | *n*0.7805 | −6.03 | +0.371 | 18 59.1 | 20 58.6 |
| 7 | .1046 | 5.71 | 0.9794 | 285 5 | 1.2902 | 313 37 | 0.7872 | 6.13 | 0.380 | 19 0.3 | 20 54.5 |
| 8 | .1074 | 5.84 | 0.9809 | 285 24 | 1.2895 | 312 36 | 0.7939 | 6.22 | 0.390 | 19 1.6 | 20 50.4 |
| 9 | .1101 | 5.98 | 0.9825 | 285 42 | 1.2888 | 311 34 | 0.8002 | 6.31 | 0.398 | 19 2.8 | 20 46.3 |
| 10 | .1128 | 6.11 | 0.9840 | 286 0 | 1.2882 | 310 33 | 0.8064 | 6.40 | 0.407 | 19 4.0 | 20 42.2 |
| 11 | .1156 | 6.24 | 0.9856 | 286 18 | 1.2875 | 309 31 | *n*0.8122 | −6.49 | +0.416 | 19 5.2 | 20 38.1 |
| 12 | .1183 | 6.37 | 0.9871 | 286 35 | 1.2869 | 308 29 | 0.8179 | 6.58 | 0.425 | 19 6.3 | 20 33.9 |
| 13 | .1211 | 6.50 | 0.9886 | 286 52 | 1.2862 | 307 27 | 0.8234 | 6.66 | 0.433 | 19 7.5 | 20 29.8 |
| 14 | .1238 | 6.63 | 0.9901 | 287 9 | 1.2856 | 306 25 | 0.8288 | 6.74 | 0.442 | 19 8.6 | 20 25.6 |
| 15 | .1265 | 6.75 | 0.9916 | 287 26 | 1.2850 | 305 22 | 0.8338 | 6.82 | 0.450 | 19 9.7 | 20 21.5 |
| 16 | .1293 | 6.88 | 0.9930 | 287 42 | 1.2843 | 304 20 | *n*0.8387 | −6.90 | +0.458 | 19 10.8 | 20 17.3 |
| 17 | .1320 | 7.00 | 0.9945 | 287 58 | 1.2837 | 303 17 | 0.8434 | 6.97 | 0.467 | 19 11.9 | 20 13.1 |
| 18 | .1347 | 7.12 | 0.9959 | 288 13 | 1.2831 | 302 14 | 0.8479 | 7.05 | 0.475 | 19 12.9 | 20 8.9 |
| h 19 | .1375 | 7.24 | 0.9973 | 288 29 | 1.2826 | 301 11 | 0.8522 | 7.12 | 0.483 | 19 13.9 | 20 4.7 |
| (10.0) 20 | .1402 | 7.36 | 0.9987 | 288 44 | 1.2820 | 300 8 | 0.8564 | 7.18 | 0.491 | 19 14.9 | 20 0.5 |
| 21 | .1430 | 7.48 | 1.0001 | 288 59 | 1.2814 | 299 5 | *n*0.8604 | −7.25 | +0.499 | 19 15.9 | 19 56.3 |
| 22 | .1457 | 7.60 | 1.0015 | 289 14 | 1.2809 | 298 1 | 0.8641 | 7.32 | 0.507 | 19 16.9 | 19 52.1 |
| 23 | .1484 | 7.71 | 1.0028 | 289 29 | 1.2803 | 296 58 | 0.8678 | 7.38 | 0.514 | 19 17.9 | 19 47.8 |
| 24 | .1512 | 7.83 | 1.0041 | 289 43 | 1.2798 | 295 54 | 0.8713 | 7.44 | 0.522 | 19 18.9 | 19 43.6 |
| 25 | .1539 | 7.94 | 1.0054 | 289 57 | 1.2793 | 294 50 | 0.8745 | 7.49 | 0.529 | 19 19.8 | 19 39.3 |
| 26 | .1566 | 8.05 | 1.0067 | 290 11 | 1.2788 | 293 46 | *n*0.8777 | −7.55 | +0.536 | 19 20.7 | 19 35.1 |
| 27 | .1594 | 8.17 | 1.0080 | 290 25 | 1.2783 | 292 42 | 0.8807 | 7.60 | 0.544 | 19 21.7 | 19 30.8 |
| 28 | .1621 | 8.28 | 1.0092 | 290 39 | 1.2779 | 291 38 | 0.8835 | 7.65 | 0.552 | 19 22.6 | 19 26.5 |
| 29 | .1649 | 8.39 | 1.0104 | 290 52 | 1.2775 | 290 34 | 0.8863 | 7.70 | 0.559 | 19 23.5 | 19 22.2 |
| 30 | 0.1676 | + 8.49 | 1.0116 | 291 6 | 1.2770 | 289 29 | *n*0.8888 | −7.74 | +0.566 | 19 24.4 | 19 18.0 |

## FOR WASHINGTON MEAN MIDNIGHT.

### QUANTITIES FOR REDUCING MEAN PLACES, 1876.0, TO APPARENT PLACES.

| Solar day. Sid. hour. | τ. | *f*. | Log *g*. | G. | Log *h*. | H. | Log *i*. | *i*. | *f*. | G. | H. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | y | ″ | | ° ′ | | ° ′ | | ″ | s | h m | h m |
| Mar. 1 | 0.1676 | + 8.49 | 1.0116 | 291 6 | 1.2770 | 289 29 | *n*0.8888 | −7.74 | +0.566 | 19 24.4 | 19 18.0 |
| 2 | .1703 | 8.60 | 1.0127 | 291 19 | 1.2766 | 288 25 | 0.8912 | 7.78 | 0.573 | 19 25.3 | 19 13.7 |
| 3 | .1731 | 8.71 | 1.0138 | 291 32 | 1.2762 | 287 20 | 0.8935 | 7.83 | 0.581 | 19 26.1 | 19 9.4 |
| 4 | .1758 | 8.82 | 1.0149 | 291 45 | 1.2758 | 286 16 | 0.8956 | 7.86 | 0.588 | 19 27.0 | 19 5.1 |
| 5 | .1786 | 8.92 | 1.0160 | 291 58 | 1.2755 | 285 11 | 0.8975 | 7.89 | 0.595 | 19 27.9 | 19 0.8 |
| ($11^{h}.0$) 6 | .1813 | 9.03 | 1.0170 | 292 11 | 1.2752 | 284 7 | *n*0.8993 | −7.93 | +0.602 | 19 28.7 | 18 56.4 |
| 7 | .1840 | 9.13 | 1.0181 | 292 24 | 1.2749 | 283 2 | 0.9010 | 7.96 | 0.609 | 19 29.6 | 18 52.1 |
| 8 | .1868 | 9.24 | 1.0191 | 292 37 | 1.2746 | 281 57 | 0.9026 | 7.99 | 0.616 | 19 30.5 | 18 47.8 |
| 9 | .1895 | 9.34 | 1.0201 | 292 50 | 1.2744 | 280 52 | 0.9040 | 8.02 | 0.623 | 19 31.3 | 18 43.5 |
| 10 | .1922 | 9.44 | 1.0210 | 293 2 | 1.2741 | 279 47 | 0.9052 | 8.04 | 0.629 | 19 32.2 | 18 39.1 |
| 11 | .1950 | 9.54 | 1.0220 | 293 15 | 1.2739 | 278 42 | *n*0.9063 | −8.06 | +0.636 | 19 33.0 | 18 34.8 |
| 12 | .1977 | 9.65 | 1.0229 | 293 28 | 1.2737 | 277 37 | 0.9074 | 8.08 | 0.643 | 19 33.9 | 18 30.5 |
| 13 | .2005 | 9.75 | 1.0238 | 293 40 | 1.2736 | 276 32 | 0.9082 | 8.10 | 0.650 | 19 34.7 | 18 26.2 |
| 14 | .2032 | 9.85 | 1.0246 | 293 53 | 1.2734 | 275 27 | 0.9089 | 8.11 | 0.657 | 19 35.5 | 18 21.8 |
| 15 | .2059 | 9.95 | 1.0255 | 294 6 | 1.2733 | 274 22 | 0.9095 | 8.12 | 0.663 | 19 36.4 | 18 17.5 |
| 16 | .2087 | 10.05 | 1.0263 | 294 18 | 1.2733 | 273 17 | *n*0.9099 | −8.13 | +0.670 | 19 37.2 | 18 13.1 |
| 17 | .2114 | 10.15 | 1.0271 | 294 31 | 1.2732 | 272 12 | 0.9102 | 8.13 | 0.677 | 19 38.1 | 18 8.8 |
| 18 | .2141 | 10.25 | 1.0279 | 294 44 | 1.2731 | 271 7 | 0.9105 | 8.14 | 0.683 | 19 38.9 | 18 4.5 |
| 19 | .2169 | 10.35 | 1.0286 | 294 57 | 1.2731 | 270 2 | 0.9106 | 8.14 | 0.690 | 19 39.8 | 18 0.2 |
| 20 | .2196 | 10.45 | 1.0294 | 295 9 | 1.2731 | 268 57 | 0.9106 | 8.14 | 0.697 | 19 40.6 | 17 55.8 |
| ($12^{h}.0$)21 | .2224 | 10.55 | 1.0301 | 295 22 | 1.2732 | 267 53 | *n*0.9104 | −8.14 | +0.704 | 19 41.5 | 17 51.5 |
| 22 | .2251 | 10.65 | 1.0308 | 295 35 | 1.2732 | 266 48 | 0.9100 | 8.13 | 0.710 | 19 42.4 | 17 47.2 |
| 23 | .2278 | 10.76 | 1.0315 | 295 48 | 1.2733 | 265 43 | 0.9096 | 8.12 | 0.717 | 19 43.2 | 17 42.9 |
| 24 | .2306 | 10.86 | 1.0322 | 296 1 | 1.2734 | 264 39 | 0.9090 | 8.11 | 0.724 | 19 44.1 | 17 38.6 |
| 25 | .2333 | 10.96 | 1.0328 | 296 15 | 1.2736 | 263 34 | 0.9083 | 8.10 | 0.731 | 19 45.0 | 17 34.3 |
| 26 | .2360 | 11.06 | 1.0334 | 296 28 | 1.2737 | 262 29 | *n*0.9075 | −8.08 | +0.737 | 19 45 8 | 17 30.0 |
| 27 | .2388 | 11.16 | 1.0341 | 296 41 | 1.2739 | 261 25 | 0.9064 | 8.06 | 0.744 | 19 46.7 | 17 25.7 |
| 28 | .2415 | 11.26 | 1.0347 | 296 54 | 1.2741 | 260 21 | 0.9054 | 8.04 | 0.751 | 19 47.6 | 17 21.4 |
| 29 | .2443 | 11.37 | 1.0352 | 297 8 | 1.2743 | 259 16 | 0.9041 | 8.02 | 0.758 | 19 48.5 | 17 17.1 |
| 30 | .2470 | 11.47 | 1.0358 | 297 22 | 1.2746 | 258 12 | 0.9027 | 7.99 | 0.765 | 19 49.4 | 17 12.8 |
| 31 | .2497 | 11.57 | 1.0364 | 297 35 | 1.2748 | 257 8 | 0.9012 | 7.97 | 0.772 | 19 50.4 | 17 8.6 |
| Apr. 1 | .2525 | 11.68 | 1.0370 | 297 49 | 1.2751 | 256 4 | *n*0.8995 | −7.94 | +0.779 | 19 51.3 | 17 4.3 |
| 2 | .2552 | 11.78 | 1.0375 | 298 3 | 1.2754 | 255 1 | 0.8978 | 7.90 | 0.785 | 19 52.2 | 17 0.0 |
| 3 | .2579 | 11.89 | 1.0381 | 298 17 | 1.2758 | 253 57 | 0.8959 | 7.87 | 0.792 | 19 53.1 | 16 55.8 |
| 4 | .2607 | 11.99 | 1.0386 | 298 31 | 1.2761 | 252 53 | 0.8939 | 7.83 | 0.800 | 19 54.1 | 16 51.6 |
| ($13^{h}.0$) 5 | .2634 | 12.10 | 1.0391 | 298 46 | 1.2765 | 251 50 | 0.8917 | 7.79 | 0.807 | 19 55.1 | 16 47.3 |
| 6 | .2662 | 12.21 | 1.0396 | 299 0 | 1.2769 | 250 47 | *n*0.8894 | −7.75 | +0.814 | 19 56.0 | 16 43.1 |
| 7 | .2689 | 12.32 | 1.0402 | 299 15 | 1.2773 | 249 44 | 0.8869 | 7.71 | 0.821 | 19 57.0 | 16 38.9 |
| 8 | .2716 | 12.43 | 1.0407 | 299 30 | 1.2777 | 248 41 | 0.8844 | 7.66 | 0.828 | 19 58.0 | 16 34.7 |
| 9 | .2744 | 12.54 | 1.0412 | 299 45 | 1.2782 | 247 38 | 0.8816 | 7.61 | 0.836 | 19 59.0 | 16 30.6 |
| 10 | .2771 | 12.65 | 1.0417 | 300 0 | 1.2786 | 246 36 | 0.8787 | 7.56 | 0.843 | 20 0.0 | 16 26.4 |
| 11 | .2799 | 12.76 | 1.0422 | 300 15 | 1.2791 | 245 33 | *n*0.8757 | −7.51 | +0.851 | 20 1.0 | 16 22.2 |
| 12 | .2826 | 12.87 | 1.0427 | 300 30 | 1.2796 | 244 31 | 0.8726 | 7.46 | 0.858 | 20 2.0 | 16 18.1 |
| 13 | .2853 | 12.99 | 1.0432 | 300 46 | 1.2801 | 243 29 | 0.8692 | 7.40 | 0.866 | 20 3.1 | 16 13.9 |
| 14 | .2881 | 13.10 | 1.0438 | 301 1 | 1.2806 | 242 27 | 0.8658 | 7.34 | 0.873 | 20 4.1 | 16 9.8 |
| 15 | .2908 | 13.21 | 1.0443 | 301 17 | 1.2811 | 241 26 | 0.8621 | 7.28 | 0.881 | 20 5.1 | 16 5.7 |
| 16 | .2935 | 13.33 | 1.0448 | 301 33 | 1.2817 | 240 24 | *n*0.8584 | −7.22 | +0.889 | 20 6.2 | 16 1.6 |
| 17 | .2963 | 13.45 | 1.0453 | 301 49 | 1.2822 | 239 23 | 0.8545 | 7.15 | 0.897 | 20 7.3 | 15 57.5 |
| 18 | .2990 | 13.57 | 1.0459 | 302 5 | 1.2828 | 238 22 | 0.8503 | 7.09 | 0.904 | 20 8.4 | 15 53.4 |
| 19 | .3018 | 13.69 | 1.0464 | 302 22 | 1.2834 | 237 21 | 0.8460 | 7.02 | 0.912 | 20 9.4 | 15 49.4 |
| ($14^{h}.0$)20 | .3045 | 13.81 | 1.0470 | 302 38 | 1.2840 | 236 20 | 0.8416 | 6.94 | 0.921 | 20 10.5 | 15 45.3 |
| 21 | .3072 | 13.93 | 1.0476 | 302 55 | 1.2846 | 235 19 | *n*0.8371 | −6.87 | +0.929 | 20 11.6 | 15 41.2 |
| 22 | .3100 | 14.06 | 1.0481 | 303 11 | 1.2852 | 234 19 | 0.8323 | 6.80 | 0.937 | 20 12.8 | 15 37.3 |
| 23 | .3127 | 14.18 | 1.0487 | 303 28 | 1.2858 | 233 19 | 0.8273 | 6.72 | 0.945 | 20 13.9 | 15 33.3 |
| 24 | .3154 | 14.31 | 1.0493 | 303 45 | 1.2864 | 232 19 | 0.8222 | 6.64 | 0.954 | 20 15.0 | 15 29.3 |
| 25 | .3182 | 14.43 | 1.0500 | 304 3 | 1.2870 | 231 19 | 0.8169 | 6.56 | 0.962 | 20 16.2 | 15 25.3 |
| 26 | .3209 | 14.56 | 1.0506 | 304 20 | 1.2876 | 230 20 | *n*0.8114 | −6.48 | +0.971 | 20 17.3 | 15 21.3 |
| 27 | .3237 | 14.69 | 1.0513 | 304 37 | 1.2883 | 229 20 | 0.8057 | 6.39 | 0.979 | 20 18.5 | 15 17.4 |
| 28 | .3264 | 14.82 | 1.0519 | 304 55 | 1.2889 | 228 21 | 0.7998 | 6.31 | 0.988 | 20 19.6 | 15 13.4 |
| 29 | .3291 | 14.96 | 1.0526 | 305 12 | 1.2895 | 227 22 | 0.7937 | 6.22 | 0.997 | 20 20.8 | 15 9.5 |
| 30 | .3319 | 15.09 | 1.0533 | 305 30 | 1.2901 | 226 23 | 0.7873 | 6.13 | 1.006 | 20 22.0 | 15 5.6 |
| 31 | 0.3346 | +15.22 | 1.0541 | 305 48 | 1.2908 | 225 25 | *n*0.7808 | −6.04 | +1.015 | 20 23.2 | 15 1.7 |

## FOR WASHINGTON MEAN MIDNIGHT.

### QUANTITIES FOR REDUCING MEAN PLACES, 1876.0, TO APPARENT PLACES.

| Solar day. Sid. hour. | τ. | f. | Log g. | G. | Log h. | H. | Log i. | i. | f. | G. | H. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | y | ″ | | ° ′ | | ° ′ | | ″ | s | h m | h m |
| May 1 | 0.3346 | +15.22 | 1.0541 | 305 48 | 1.2908 | 225 25 | n0.7808 | −6.04 | +1.015 | 20 23.2 | 15 1.7 |
| 2 | .3373 | 15.36 | 1.0548 | 306 5 | 1.2914 | 224 27 | 0.7741 | 5.95 | 1.024 | 20 24.4 | 14 57.8 |
| 3 | .3401 | 15.50 | 1.0556 | 306 23 | 1.2921 | 223 28 | 0.7672 | 5.85 | 1.033 | 20 25.6 | 14 53.9 |
| 4 | .3428 | 15.64 | 1.0564 | 306 41 | 1.2927 | 222 31 | 0.7599 | 5.75 | 1.043 | 20 26.8 | 14 50.0 |
| 5 | .3456 | 15.78 | 1.0572 | 306 59 | 1.2933 | 221 33 | 0.7524 | 5.66 | 1.052 | 20 28.0 | 14 46.2 |
| (15$^{h}$.0) 6 | .3483 | 15.92 | 1.0581 | 307 18 | 1.2939 | 220 35 | n0.7448 | −5.56 | +1.061 | 20 29.2 | 14 42.4 |
| 7 | .3510 | 16.06 | 1.0589 | 307 36 | 1.2946 | 219 38 | 0.7368 | 5.46 | 1.070 | 20 30.4 | 14 38.5 |
| 8 | .3538 | 16.20 | 1.0598 | 307 54 | 1.2952 | 218 41 | 0.7285 | 5.35 | 1.080 | 20 31.6 | 14 34.7 |
| 9 | .3565 | 16.35 | 1.0607 | 308 12 | 1.2958 | 217 44 | 0.7199 | 5.25 | 1.090 | 20 32.8 | 14 30.9 |
| 10 | .3593 | 16.49 | 1.0617 | 308 31 | 1.2964 | 216 47 | 0.7111 | 5.14 | 1.099 | 20 34.0 | 14 27.1 |
| 11 | .3620 | 16.64 | 1.0627 | 308 49 | 1.2970 | 215 50 | n0.7021 | −5.04 | +1.109 | 20 35.3 | 14 23.4 |
| 12 | .3647 | 16.79 | 1.0637 | 309 7 | 1.2976 | 214 54 | 0.6926 | 4.93 | 1.119 | 20 36.5 | 14 19.6 |
| 13 | .3675 | 16.94 | 1.0647 | 309 25 | 1.2982 | 213 58 | 0.6828 | 4.82 | 1.129 | 20 37.7 | 14 15.9 |
| 14 | .3702 | 17 09 | 1.0657 | 309 44 | 1.2988 | 213 2 | 0.6726 | 4.71 | 1.139 | 20 38.9 | 14 12.1 |
| 15 | .3729 | 17.24 | 1.0668 | 310 2 | 1.2993 | 212 6 | 0.6621 | 4.59 | 1.149 | 20 40.1 | 14 8.4 |
| 16 | .3757 | 17.39 | 1.0679 | 310 20 | 1.2999 | 211 10 | n0.6513 | −4.48 | +1.160 | 20 41.4 | 14 4.7 |
| 17 | .3784 | 17.55 | 1.0691 | 310 39 | 1.3005 | 210 15 | 0.6401 | 4.37 | 1.170 | 20 42.6 | 14 1.0 |
| 18 | .3812 | 17.70 | 1.0702 | 310 57 | 1.3010 | 209 19 | 0.6284 | 4.25 | 1.180 | 20 43.8 | 13 57.3 |
| 19 | .3839 | 17.86 | 1.0714 | 311 15 | 1.3015 | 208 24 | 0.6162 | 4.13 | 1.191 | 20 45.0 | 13 53.6 |
| 20 | .3866 | 18.02 | 1.0727 | 311 33 | 1.3021 | 207 29 | 0.6036 | 4.01 | 1.201 | 20 46.2 | 13 49.9 |
| (16$^{h}$.0) 21 | .3894 | 18.18 | 1.0739 | 311 51 | 1.3026 | 206 34 | n0.5905 | − 3.90 | +1.212 | 20 47.4 | 13 46.3 |
| 22 | .3921 | 18.34 | 1.0752 | 312 9 | 1.3031 | 205 39 | 0.5769 | 3.78 | 1.223 | 20 48.6 | 13 42.6 |
| 23 | .3948 | 18.50 | 1.0765 | 312 27 | 1.3036 | 204 44 | 0.5626 | 3.65 | 1.233 | 20 49.8 | 13 39.0 |
| 24 | .3976 | 18.66 | 1.0778 | 312 45 | 1.3040 | 203 50 | 0.5478 | 3.53 | 1.244 | 20 51.0 | 13 35.3 |
| 25 | .4003 | 18.82 | 1.0792 | 313 3 | 1.3045 | 202 55 | 0.5324 | 3.41 | 1.255 | 20 52.2 | 13 31.7 |
| 26 | .4031 | 18.99 | 1.0806 | 313 20 | 1.3049 | 202 1 | n0.5163 | −3.28 | +1.266 | 20 53.4 | 13 28.1 |
| 27 | .4058 | 19.15 | 1.0820 | 313 38 | 1.3053 | 201 7 | 0.4994 | 3.16 | 1.277 | 20 54.5 | 13 24.5 |
| 28 | .4085 | 19.32 | 1.0835 | 313 55 | 1.3058 | 200 13 | 0.4817 | 3.03 | 1.288 | 20 55.7 | 13 20.9 |
| 29 | .4113 | 19.49 | 1.0849 | 314 13 | 1.3061 | 199 19 | 0.4631 | 2.91 | 1.299 | 20 56.8 | 13 17.3 |
| 30 | .4140 | 19.66 | 1.0864 | 314 30 | 1.3065 | 198 25 | 0.4437 | 2.78 | 1.310 | 20 58.0 | 13 13.7 |
| 31 | .4167 | 19.82 | 1.0880 | 314 47 | 1.3069 | 197 32 | 0.4232 | 2.65 | 1.322 | 20 59.1 | 13 10.1 |
| June 1 | .4195 | 19.99 | 1.0895 | 315 4 | 1.3073 | 196 38 | n0.4016 | −2.52 | +1.333 | 21 0.3 | 13 6.5 |
| 2 | .4222 | 20.16 | 1.0911 | 315 20 | 1.3076 | 195 45 | 0.3786 | 2.39 | 1.344 | 21 1.4 | 13 3.0 |
| 3 | .4250 | 20.33 | 1.0927 | 315 37 | 1.3079 | 194 51 | 0.3543 | 2.26 | 1.355 | 21 2.5 | 12 59.4 |
| 4 | .4277 | 20.50 | 1.0943 | 315 53 | 1.3082 | 193 58 | 0.3284 | 2.13 | 1.367 | 21 3.6 | 12 55.9 |
| (17$^{h}$.0) 5 | .4304 | 20.67 | 1.0960 | 316 10 | 1.3085 | 193 5 | 0.3008 | 2.00 | 1.378 | 21 4.6 | 12 52.3 |
| 6 | .4332 | 20.85 | 1.0976 | 316 26 | 1.3088 | 192 12 | n0.2711 | −1.87 | +1.390 | 21 5.7 | 12 48.8 |
| 7 | .4359 | 21.02 | 1.0993 | 316 42 | 1.3090 | 191 19 | 0.2393 | 1.74 | 1.401 | 21 6.8 | 12 45.3 |
| 8 | .4387 | 21.20 | 1.1010 | 316 57 | 1.3092 | 190 26 | 0.2049 | 1.60 | 1.413 | 21 7.8 | 12 41.7 |
| 9 | .4414 | 21.37 | 1.1028 | 317 13 | 1.3094 | 189 33 | 0.1670 | 1.47 | 1.425 | 21 8.8 | 12 38.2 |
| 10 | .4441 | 21.54 | 1.1045 | 317 28 | 1.3096 | 188 40 | 0.1255 | 1.34 | 1.436 | 21 9.9 | 12 34.7 |
| 11 | .4469 | 21.72 | 1.1063 | 317 43 | 1.3098 | 187 47 | n0.0795 | −1.20 | +1.448 | 21 10.9 | 12 31.2 |
| 12 | .4496 | 21.89 | 1.1081 | 317 58 | 1.3100 | 186 55 | 0.0282 | 1.07 | 1.460 | 21 11.9 | 12 27.6 |
| 13 | .4523 | 22.07 | 1.1099 | 318 13 | 1.3101 | 186 2 | 9.9694 | 0.93 | 1.471 | 21 12.8 | 12 24.1 |
| 14 | .4551 | 22.24 | 1.1117 | 318 27 | 1.3103 | 185 9 | 9.9015 | 0.80 | 1.483 | 21 13.8 | 12 20.6 |
| 15 | .4578 | 22.42 | 1.1135 | 318 41 | 1.3104 | 184 17 | 9.8209 | 0.66 | 1.495 | 21 14.7 | 12 17.1 |
| 16 | .4606 | 22.60 | 1.1154 | 318 55 | 1.3104 | 183 24 | n9.7218 | −0.53 | +1.506 | 21 15.7 | 12 13.6 |
| 17 | .4633 | 22.77 | 1.1172 | 319 9 | 1.3105 | 182 32 | 9.5933 | 0.39 | 1.518 | 21 16.6 | 12 10.1 |
| (18$^{h}$.0) 18 | .4660 | 22.95 | 1.1191 | 319 23 | 1.3106 | 181 39 | 9.4082 | 0.26 | 1.530 | 21 17.5 | 12 6.6 |
| 19 | .4688 | 23.13 | 1.1210 | 319 36 | 1.3106 | 180 47 | n9.0792 | −0.12 | 1.542 | 21 18.4 | 12 3.1 |
| 20 | .4715 | 23.30 | 1.1229 | 319 49 | 1.3106 | 179 54 | p8.2041 | +0.02 | 1.553 | 21 19.3 | 11 59.6 |
| 21 | .4742 | 23.48 | 1.1248 | 320 2 | 1.3106 | 179 1 | 9.1790 | +0.15 | +1.565 | 21 20.1 | 11 56.1 |
| 22 | .4770 | 23.66 | 1.1267 | 320 15 | 1.3106 | 178 9 | 9.4564 | 0.29 | 1.577 | 21 21.0 | 11 52.6 |
| 23 | .4797 | 23.83 | 1.1286 | 320 27 | 1.3105 | 177 16 | 9.6243 | 0.42 | 1.589 | 21 21.8 | 11 49.1 |
| 24 | .4825 | 24.01 | 1.1305 | 320 39 | 1.3104 | 176 24 | 9.7459 | 0.56 | 1.600 | 21 22.6 | 11 45.6 |
| 25 | .4852 | 24.18 | 1.1325 | 320 51 | 1.3103 | 175 31 | 9.8401 | 0.69 | 1.612 | 21 23.4 | 11 42.1 |
| 26 | .4879 | 24.36 | 1.1344 | 321 3 | 1.3102 | 174 39 | 9.9175 | +0.83 | +1.624 | 21 24.2 | 11 38.6 |
| 27 | .4907 | 24.53 | 1.1364 | 321 14 | 1.3101 | 173 46 | 9.9832 | 0.96 | 1.635 | 21 25.0 | 11 35.1 |
| 28 | .4934 | 24.71 | 1.1383 | 321 25 | 1.3100 | 172 54 | 0.0398 | 1.10 | 1.647 | 21 25.7 | 11 31 6 |
| 29 | .4961 | 24.88 | 1.1403 | 321 36 | 1.3098 | 172 1 | 0.0899 | 1.23 | 1.659 | 21 26.4 | 11 28.1 |
| 30 | .4989 | 25.06 | 1.1422 | 321 47 | 1.3096 | 171 8 | 0.1348 | 1.36 | 1.670 | 21 27.1 | 11 24.6 |
| 31 | 0.5016 | +25.23 | 1.1442 | 321 58 | 1.3094 | 170 16 | 0.1752 | +1.50 | +1.682 | 21 27.8 | 11 21.0 |

## FOR WASHINGTON MEAN MIDNIGHT.

### QUANTITIES FOR REDUCING MEAN PLACES, 1876.0, TO APPARENT PLACES.

| Solar day. Sid. hour. | τ. | f. | Log g. | G. | Log h. | H. | Log i. | i. | f. | G. | H. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | y | ″ | | ° ′ | | ° ′ | | ″ | s | h m | h m |
| July 1 | 0.5016 | +25.23 | 1.1442 | 321 58 | 1.3094 | 170 16 | 0.1752 | +1.50 | +1.682 | 21 27.8 | 11 21.0 |
| 2 | .5044 | 25.41 | 1.1462 | 322 8 | 1.3092 | 169 23 | 0.2122 | 1.63 | 1.694 | 21 28.5 | 11 17.5 |
| 3 | .5071 | 25.58 | 1.1481 | 322 18 | 1.3090 | 168 30 | 0.2460 | 1.76 | 1.705 | 21 29.2 | 11 14.0 |
| 4 | .5098 | 25.75 | 1.1501 | 322 28 | 1.3087 | 167 37 | 0.2774 | 1.89 | 1.717 | 21 29.9 | 11 10.5 |
| 5 | .5126 | 25.92 | 1.1520 | 322 38 | 1.3084 | 166 44 | 0.3066 | 2.03 | 1.728 | 21 30.5 | 11 7.0 |
| $(19^{h}.0)$ 6 | .5153 | 26.10 | 1.1540 | 322 47 | 1.3082 | 165 51 | 0.3338 | +2.16 | +1.740 | 21 31.1 | 11 3.4 |
| 7 | .5181 | 26.27 | 1.1560 | 322 56 | 1.3079 | 164 58 | 0.3593 | 2.29 | 1.751 | 21 31.7 | 10 59.8 |
| 8 | .5208 | 26.44 | 1.1579 | 323 5 | 1.3075 | 164 5 | 0.3833 | 2.42 | 1.762 | 21 32.3 | 10 56.3 |
| 9 | .5235 | 26.61 | 1.1599 | 323 14 | 1.3072 | 163 12 | 0.4059 | 2.55 | 1.774 | 21 32.9 | 10 52.8 |
| 10 | .5263 | 26.78 | 1.1618 | 323 22 | 1.3068 | 162 18 | 0.4273 | 2.68 | 1.785 | 21 33.5 | 10 49.2 |
| 11 | .5290 | 26.94 | 1.1637 | 323 31 | 1.3065 | 161 25 | 0.4475 | +2.80 | +1.796 | 21 34.0 | 10 45.7 |
| 12 | .5317 | 27.11 | 1.1657 | 323 39 | 1.3061 | 160 31 | 0.4667 | 2.93 | 1.807 | 21 34.6 | 10 42.1 |
| 13 | .5345 | 27.28 | 1.1677 | 323 47 | 1.3057 | 159 38 | 0.4850 | 3.06 | 1.818 | 21 35.1 | 10 38.5 |
| 14 | .5372 | 27.44 | 1.1695 | 323 54 | 1.3053 | 158 44 | 0.5024 | 3.18 | 1.829 | 21 35.6 | 10 34.9 |
| 15 | .5400 | 27.60 | 1.1714 | 324 2 | 1.3048 | 157 50 | 0.5190 | 3.30 | 1.840 | 21 36.1 | 10 31.3 |
| 16 | .5427 | 27.77 | 1.1733 | 324 9 | 1.3044 | 156 56 | 0.5349 | +3.43 | +1.851 | 21 36.6 | 10 27.7 |
| 17 | .5454 | 27.93 | 1.1752 | 324 16 | 1.3040 | 156 2 | 0.5501 | 3.55 | 1.862 | 21 37.1 | 10 24.1 |
| 18 | .5482 | 28.09 | 1.1770 | 324 23 | 1.3035 | 155 8 | 0.5647 | 3.67 | 1.873 | 21 37.6 | 10 20.5 |
| 19 | .5509 | 28.25 | 1.1789 | 324 30 | 1.3030 | 154 13 | 0.5787 | 3.79 | 1.884 | 21 38.0 | 10 16.9 |
| 20 | .5536 | 28.41 | 1.1808 | 324 37 | 1.3025 | 153 19 | 0.5922 | 3.91 | 1.894 | 21 38.4 | 10 13.3 |
| $(20^{h}.0)$ 21 | .5564 | 28.57 | 1.1826 | 324 43 | 1.3020 | 152 24 | 0.6052 | +4.03 | +1.905 | 21 38.9 | 10 9.6 |
| 22 | .5591 | 28.73 | 1.1844 | 324 49 | 1.3015 | 151 29 | 0.6177 | 4.15 | 1.915 | 21 39.3 | 10 6.0 |
| 23 | .5619 | 28.89 | 1.1862 | 324 55 | 1.3009 | 150 34 | 0.6297 | 4.26 | 1.926 | 21 39.7 | 10 2.3 |
| 24 | .5646 | 29.04 | 1.1880 | 325 1 | 1.3004 | 149 39 | 0.6412 | 4.38 | 1.936 | 21 40.1 | 9 58.6 |
| 25 | .5673 | 29.19 | 1.1898 | 325 7 | 1.2999 | 148 44 | 0.6523 | 4.49 | 1.946 | 21 40.5 | 9 55.0 |
| 26 | .5701 | 29.35 | 1.1916 | 325 13 | 1.2993 | 147 49 | 0.6632 | +4.61 | +1.956 | 21 40.8 | 9 51.3 |
| 27 | .5728 | 29.50 | 1.1934 | 325 18 | 1.2987 | 146 54 | 0.6737 | 4.72 | 1.967 | 21 41.2 | 9 47.6 |
| 28 | .5755 | 29.65 | 1.1951 | 325 23 | 1.2981 | 145 58 | 0.6836 | 4.83 | 1.977 | 21 41.6 | 9 43.9 |
| 29 | .5783 | 29.80 | 1.1968 | 325 29 | 1.2976 | 145 2 | 0.6933 | 4.94 | 1.987 | 21 41.9 | 9 40.1 |
| 30 | .5810 | 29.95 | 1.1986 | 325 34 | 1.2970 | 144 6 | 0.7026 | 5.04 | 1.996 | 21 42.2 | 9 36.4 |
| 31 | .5838 | 30.09 | 1.2003 | 325 39 | 1.2964 | 143 10 | 0.7116 | 5.15 | 2.006 | 21 42.6 | 9 32.7 |
| Aug. 1 | .5865 | 30.24 | 1.2019 | 325 43 | 1.2958 | 142 14 | 0.7204 | +5.25 | +2.016 | 21 42.9 | 9 28.9 |
| 2 | .5892 | 30.38 | 1.2036 | 325 48 | 1.2952 | 141 17 | 0.7288 | 5.36 | 2.026 | 21 43.2 | 9 25.1 |
| 3 | .5920 | 30.53 | 1.2052 | 325 53 | 1.2946 | 140 20 | 0.7369 | 5.46 | 2.035 | 21 43.5 | 9 21.4 |
| 4 | .5947 | 30.67 | 1.2069 | 325 57 | 1.2939 | 139 23 | 0.7449 | 5.56 | 2.045 | 21 43.8 | 9 17.6 |
| $(21^{h}.0)$ 5 | .5975 | 30.81 | 1.2085 | 326 1 | 1.2933 | 138 26 | 0.7525 | 5.66 | 2.054 | 21 44.1 | 9 13.8 |
| 6 | .6002 | 30.95 | 1.2101 | 326 6 | 1.2926 | 137 29 | 0.7598 | +5.75 | +2.063 | 21 44.4 | 9 10.0 |
| 7 | .6029 | 31.09 | 1.2117 | 326 10 | 1.2921 | 136 32 | 0.7672 | 5.85 | 2.072 | 21 44.7 | 9 6.1 |
| 8 | .6057 | 31.22 | 1.2133 | 326 14 | 1.2914 | 135 35 | 0.7739 | 5.94 | 2.082 | 21 44.9 | 9 2.3 |
| 9 | .6084 | 31.36 | 1.2148 | 326 18 | 1.2908 | 134 37 | 0.7807 | 6.04 | 2.091 | 21 45.2 | 8 58.4 |
| 10 | .6111 | 31.49 | 1.2163 | 326 22 | 1.2902 | 133 39 | 0.7872 | 6.13 | 2.100 | 21 45.4 | 8 54.6 |
| 11 | .6139 | 31.62 | 1.2178 | 326 25 | 1.2895 | 132 40 | 0.7934 | +6.21 | +2.108 | 21 45.7 | 8 50.7 |
| 12 | .6166 | 31.76 | 1.2193 | 326 29 | 1.2889 | 131 42 | 0.8003 | 6.30 | 2.117 | 21 45.9 | 8 46.8 |
| 13 | .6194 | 31.89 | 1.2208 | 326 33 | 1.2883 | 130 44 | 0.8053 | 6.39 | 2.126 | 21 46.2 | 8 42.9 |
| 14 | .6221 | 32.02 | 1.2223 | 326 36 | 1.2877 | 129 45 | 0.8110 | 6.47 | 2.135 | 21 46.4 | 8 39.0 |
| 15 | .6248 | 32.15 | 1.2237 | 326 40 | 1.2871 | 128 46 | 0.8164 | 6.55 | 2.143 | 21 46.7 | 8 35.1 |
| 16 | .6276 | 32.27 | 1.2251 | 326 43 | 1.2864 | 127 47 | 0.8218 | +6.63 | +2.151 | 21 46.9 | 8 31.1 |
| 17 | .6303 | 32.40 | 1.2265 | 326 47 | 1.2858 | 126 48 | 0.8268 | 6.71 | 2.160 | 21 47.1 | 8 27.2 |
| 18 | .6330 | 32.52 | 1.2279 | 326 50 | 1.2852 | 125 48 | 0.8317 | 6.79 | 2.168 | 21 47.3 | 8 23.2 |
| 19 | .6358 | 32.64 | 1.2293 | 326 54 | 1.2846 | 124 48 | 0.8364 | 6.86 | 2.176 | 21 47.6 | 8 19.2 |
| $(22^{h}.0)$ 20 | .6385 | 32.76 | 1.2306 | 326 57 | 1.2841 | 123 49 | 0.8410 | 6.94 | 2.184 | 21 47.8 | 8 15.2 |
| 21 | .6413 | 32.89 | 1.2320 | 327 0 | 1.2835 | 122 48 | 0.8455 | +7.01 | +2.192 | 21 48.0 | 8 11.2 |
| 22 | .6440 | 33.01 | 1.2333 | 327 3 | 1.2829 | 121 48 | 0.8497 | 7.08 | 2.200 | 21 48.2 | 8 7.2 |
| 23 | .6467 | 33.13 | 1.2346 | 327 7 | 1.2823 | 120 48 | 0.8538 | 7.14 | 2.208 | 21 48.4 | 8 3.2 |
| 24 | .6495 | 33.24 | 1.2359 | 327 10 | 1.2818 | 119 47 | 0.8577 | 7.21 | 2.216 | 21 48.7 | 7 59.1 |
| 25 | .6522 | 33.36 | 1.2371 | 327 13 | 1.2812 | 118 46 | 0.8615 | 7.27 | 2.224 | 21 48.9 | 7 55.1 |
| 26 | .6549 | 33.48 | 1.2384 | 327 16 | 1.2807 | 117 45 | 0.8651 | +7.33 | +2.232 | 21 49.1 | 7 51.0 |
| 27 | .6577 | 33.59 | 1.2396 | 327 20 | 1.2802 | 116 44 | 0.8685 | 7.39 | 2.239 | 21 49.3 | 7 47.0 |
| 28 | .6604 | 33.71 | 1.2408 | 327 23 | 1.2797 | 115 43 | 0.8718 | 7.44 | 2.247 | 21 49.5 | 7 42.9 |
| 29 | .6632 | 33.82 | 1.2419 | 327 26 | 1.2792 | 114 41 | 0.8750 | 7.50 | 2.254 | 21 49.7 | 7 38.8 |
| 30 | .6659 | 33.93 | 1.2431 | 327 29 | 1.2787 | 113 40 | 0.8781 | 7.55 | 2.262 | 21 50.0 | 7 34.7 |
| 31 | 0.6686 | +34.04 | 1.2443 | 327 33 | 1.2783 | 112 38 | 0.8808 | +7.60 | +2.269 | 21 50.2 | 7 30.5 |

## FOR WASHINGTON MEAN MIDNIGHT.

### QUANTITIES FOR REDUCING MEAN PLACES, 1876.0, TO APPARENT PLACES.

| Solar day. Sid. hour. | τ. | *f*. | Log *g*. | G. | Log *h*. | H. | Log *i*. | *i*. | *f*. | G. | H. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | y | ″ | | ° ′ | | ° ′ | | ″ | s | h m | h m |
| Sept. 1 | 0.6714 | +34.15 | 1.2454 | 327 36 | 1.2779 | 111 36 | 0.8836 | +7.65 | +2.277 | 21 50.4 | 7 26.4 |
| 2 | .6741 | 34.26 | 1.2465 | 327 39 | 1.2774 | 110 34 | 0.8862 | 7.70 | 2.284 | 21 50.6 | 7 22.3 |
| h 3 | .6768 | 34.37 | 1.2477 | 327 42 | 1.2770 | 109 32 | 0.8887 | 7.74 | 2.291 | 21 50.8 | 7 18.1 |
| (23.0) 4 | .6796 | 34.47 | 1.2487 | 327 46 | 1.2766 | 108 29 | 0.8911 | 7.78 | 2.298 | 21 51.1 | 7 14.0 |
| 5 | .6823 | 34.58 | 1.2498 | 327 49 | 1.2762 | 107 27 | 0.8932 | 7.82 | 2.305 | 21 51.3 | 7 9.8 |
| 6 | .6851 | 34·69 | 1.2509 | 327 53 | 1.2759 | 106 24 | 0.8953 | +7.86 | +2.313 | 21 51.5 | 7 5.6 |
| 7 | .6878 | 34.79 | 1.2519 | 327 56 | 1.2756 | 105 21 | 0.8972 | 7.89 | 2.320 | 21 51.7 | 7 1.4 |
| 8 | .6905 | 34.90 | 1 2530 | 328 0 | 1.2752 | 104 19 | 0.8991 | 7.93 | 2.327 | 21 52.0 | 6 57.2 |
| 9 | .6933 | 35.00 | 1.2540 | 328 3 | 1.2749 | 103 15 | 0.9006 | 7.96 | 2.333 | 21 52.2 | 6 53 0 |
| 10 | .6960 | 35.11 | 1.2550 | 328 7 | 1.2747 | 102 12 | 0.9022 | 7.98 | 2.340 | 21 52.5 | 6 48.8 |
| 11 | .6988 | 35.21 | 1.2559 | 328 10 | 1.2744 | 101 9 | 0.9036 | +8.01 | +2.347 | 21 52.7 | 6 44.6 |
| 12 | .7015 | 35.31 | 1.2569 | 328 14 | 1.2742 | 100 6 | 0.9048 | 8.03 | 2.354 | 21 52.9 | 6 40.4 |
| 13 | .7042 | 35.41 | 1.2579 | 328 18 | 1.2740 | 99 2 | 0.9060 | 8.05 | 2.361 | 21 53.2 | 6 36.2 |
| 14 | .7070 | 35.51 | 1.2588 | 328 22 | 1.2738 | 97 59 | 0.9069 | 8.07 | 2.368 | 21 53.5 | 6 31.9 |
| 15 | .7097 | 35.62 | 1.2598 | 328 26 | 1.2736 | 96 55 | 0.9078 | 8.09 | 2.374 | 21 53.7 | 6 27.7 |
| 16 | .7124 | 35.72 | 1.2607 | 328 30 | 1.2735 | 95 51 | 0.9086 | +8.10 | +2.381 | 21 54.0 | 6 23.4 |
| 17 | .7152 | 35.82 | 1.2616 | 328 34 | 1.2734 | 94 47 | 0.9093 | 8.12 | 2.388 | 21 54.3 | 6 19.2 |
| 18 | .7179 | 35.92 | 1.2625 | 328 38 | 1.2733 | 93 43 | 0.9098 | 8.13 | 2.395 | 21 54.5 | 6 14.9 |
| h 19 | .7207 | 36.02 | 1.2634 | 328 42 | 1.2732 | 92 39 | 0.9102 | 8.13 | 2.401 | 21 54.8 | 6 10.6 |
| (0.0) 20 | .7234 | 36.12 | 1.2643 | 328 46 | 1.2732 | 91 35 | 0.9105 | 8.14 | 2.408 | 21 55.1 | 6 6.4 |
| 21 | .7261 | 36.22 | 1.2651 | 328 51 | 1.2731 | 90 31 | 0.9106 | +8.14 | +2.415 | 21 55.4 | 6 2.1 |
| 22 | .7289 | 36.32 | 1.2660 | 328 55 | 1.2731 | 89 27 | 0.9105 | 8.14 | 2.421 | 21 55.7 | 5 57.8 |
| 23 | .7316 | 36 42 | 1.2669 | 329 0 | 1.2732 | 88 23 | 0.9104 | 8.14 | 2.428 | 21 56.0 | 5 53.5 |
| 24 | .7343 | 36.52 | 1.2677 | 329 4 | 1.2732 | 87 19 | 0.9101 | 8.13 | 2.435 | 21 56.3 | 5 49.3 |
| 25 | .7371 | 36.62 | 1.2686 | 329 9 | 1.2733 | 86 15 | 0.9098 | 8.12 | 2.441 | 21 56.6 | 5 45.0 |
| 26 | .7398 | 36.72 | 1.2694 | 329 14 | 1.2734 | 85 11 | 0.9093 | +8.12 | +2.448 | 21 56.9 | 5 40.7 |
| 27 | .7426 | 36.82 | 1.2702 | 329 19 | 1.2735 | 84 6 | 0.9086 | 8.10 | 2.455 | 21 57.3 | 5 36.4 |
| 28 | .7453 | 36.92 | 1.2710 | 329 24 | 1.2736 | 83 2 | 0.9079 | 8.09 | 2.462 | 21 57.6 | 5 32.2 |
| 29 | .7480 | 37.03 | 1.2718 | 329 29 | 1.2738 | 81 58 | 0.9070 | 8.07 | 2.468 | 21 57.9 | 5 27.9 |
| 30 | .7508 | 37.13 | 1.2727 | 329 34 | 1.2740 | 80 54 | 0.9060 | 8.05 | 2.475 | 21 58.3 | 5 23.6 |
| Oct. 1 | .7535 | 37.23 | 1.2735 | 329 39 | 1.2742 | 79 50 | 0.9048 | +8.03 | +2.482 | 21 58.6 | 5 19.3 |
| 2 | .7562 | 37.33 | 1.2743 | 329 45 | 1.2744 | 78 46 | 0.9035 | 8.01 | 2.489 | 21 59.0 | 5 15.1 |
| 3 | .7590 | 37.44 | 1.2751 | 329 50 | 1.2747 | 77 42 | 0.9021 | 7.98 | 2.496 | 21 59.3 | 5 10 8 |
| h 4 | .7617 | 37.54 | 1.2759 | 329 56 | 1.2750 | 76 38 | 0.9005 | 7.95 | 2.503 | 21 59.7 | 5 6.5 |
| (1.0 5 | .7645 | 37.64 | 1.2766 | 330 1 | 1.2753 | 75 34 | 0.8988 | 7.92 | 2.510 | 22 0.1 | 5 2.2 |
| 6 | .7672 | 37.75 | 1.2774 | 330 7 | 1.2756 | 74 30 | 0.8969 | +7.89 | +2.517 | 22 0.5 | 4 58.0 |
| 7 | .7699 | 37.86 | 1.2782 | 330 13 | 1.2759 | 73 26 | 0.8949 | 7.85 | 2.524 | 22 0.9 | 4 53.7 |
| 8 | .7727 | 37.96 | 1.2790 | 330 19 | 1.2763 | 72 22 | 0.8928 | 7.81 | 2.531 | 22 1.3 | 4 49.5 |
| 9 | .7754 | 38.07 | 1.2798 | 330 25 | 1.2767 | 71 18 | 0.8905 | 7.77 | 2.538 | 22 1.7 | 4 45.2 |
| 10 | .7782 | 38.18 | 1.2806 | 330 31 | 1.2771 | 70 15 | 0.8882 | 7.73 | 2.545 | 22 2.1 | 4 41.0 |
| 11 | .7809 | 38.28 | 1.2814 | 330 37 | 1.2775 | 69 11 | 0.8856 | +7.69 | +2.552 | 22 2.5 | 4 36.8 |
| 12 | .7836 | 38.39 | 1.2822 | 330 44 | 1.2779 | 68 8 | 0.8830 | 7.64 | 2.560 | 22 2.9 | 4 32.5 |
| 13 | .7864 | 38.50 | 1.2829 | 330 50 | 1.2784 | 67 4 | 0.8801 | 7.59 | 2.567 | 22 3.3 | 4 28.3 |
| 14 | .7891 | 38.61 | 1.2837 | 330 57 | 1.2789 | 66 1 | 0.8771 | 7.54 | 2.574 | 22 3.8 | 4 24.1 |
| 15 | .7918 | 38.73 | 1.2846 | 331 3 | 1.2794 | 64 58 | 0.8740 | 7.48 | 2.582 | 22 4.2 | 4 19.9 |
| 16 | .7946 | 38.84 | 1.2854 | 331 10 | 1.2799 | 63 55 | 0.8707 | +7.43 | +2.589 | 22 4.7 | 4 15.7 |
| 17 | .7973 | 38.95 | 1.2862 | 331 17 | 1.2804 | 62 52 | 0.8672 | 7.37 | 2.597 | 22 5.1 | 4 11.5 |
| 18 | .8001 | 39.07 | 1.2870 | 331 24 | 1.2809 | 61 49 | 0.8636 | 7.31 | 2.605 | 22 5.6 | 4 7.3 |
| h 19 | .8028 | 39.19 | 1.2878 | 331 30 | 1.2815 | 60 46 | 0.8598 | 7.24 | 2.612 | 22 6.0 | 4 3.1 |
| (2.0) 20 | .8055 | 39.30 | 1.2886 | 331 38 | 1.2821 | 59 44 | 0.8558 | 7.18 | 2.620 | 22 6.5 | 3 58.9 |
| 21 | .8083 | 39.42 | 1.2894 | 331 45 | 1.2826 | 58 41 | 0.8516 | +7.11 | +2.628 | 22 7.0 | 3 54.8 |
| 22 | .8110 | 39.54 | 1.2903 | 331 52 | 1.2832 | 57 39 | 0.8473 | 7.04 | 2.636 | 22 7.5 | 3 50.6 |
| 23 | .8137 | 39.66 | 1.2911 | 331 59 | 1.2838 | 56 37 | 0.8429 | 6.97 | 2.644 | 22 7.9 | 3 46.5 |
| 24 | .8165 | 39.79 | 1.2920 | 332 6 | 1.2844 | 55 35 | 0.8383 | 6.89 | 2.652 | 22 8.4 | 3 42.3 |
| 25 | .8192 | 39.91 | 1.2928 | 332 14 | 1.2850 | 54 33 | 0.8334 | 6.81 | 2.661 | 22 8.9 | 3 38.2 |
| 26 | .8220 | 40.04 | 1.2937 | 332 21 | 1.2856 | 53 31 | 0.8283 | 6.74 | 2.669 | 22 9.4 | 3 34.1 |
| 27 | .8247 | 40.16 | 1.2946 | 332 29 | 1.2863 | 52 29 | 0.8231 | +6.65 | +2.677 | 22 9.9 | 3 30.0 |
| 28 | .8274 | 40.29 | 1.2954 | 332 36 | 1.2869 | 51 28 | 0.8176 | 6.57 | 2.686 | 22 10.4 | 3 25.9 |
| 29 | .8302 | 40.42 | 1.2963 | 332 44 | 1.2876 | 50 27 | 0.8120 | 6.49 | 2.695 | 22 10.9 | 3 21.8 |
| 30 | .8329 | 40.54 | 1.2972 | 332 51 | 1.2882 | 49 25 | 0.8061 | 6.40 | 2.703 | 22 11.4 | 3 17.7 |
| 31 | .8356 | 40.68 | 1.2982 | 332 59 | 1.2888 | 48 24 | 0.8001 | 6.31 | 2.712 | 22 11.9 | 3 13.6 |
| 32 | 0.8384 | +40.82 | 1.2991 | 333 7 | 1.2895 | 47 23 | 0.7938 | +6.22 | +2.721 | 22 12.5 | 3 9.6 |

## FOR WASHINGTON MEAN MIDNIGHT.

## QUANTITIES FOR REDUCING MEAN PLACES, 1876.0, TO APPARENT PLACES.

| Solar day. Sid. hour. | τ. | *f*. | Log *g*. | G. | Log *h*. | H. | Log *i*. | *i*. | *f*. | G. | H. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | y | ″ | | ° ′ | | ° ′ | | ″ | s | h m | h m |
| Nov. 1 | 0.8384 | +40.82 | 1.2991 | 333 7 | 1.2895 | 47 23 | 0.7938 | +6.22 | +2.721 | 22 12.5 | 3 9.6 |
| 2 | .8411 | 40.95 | 1.3000 | 333 15 | 1.2901 | 46 23 | 0.7872 | 6.13 | 2.730 | 22 13.0 | 3 5.5 |
| h 3 | .8439 | 41.09 | 1.3010 | 333 22 | 1.2908 | 45 22 | 0.7805 | 6.03 | 2.739 | 22 13.5 | 3 1.5 |
| (3.0) 4 | .8466 | 41.22 | 1.3019 | 333 30 | 1.2915 | 44 22 | 0.7735 | 5.94 | 2.748 | 22 14.0 | 2 57.5 |
| 5 | 8493 | 41.36 | 1.3029 | 333 38 | 1.2921 | 43 22 | 0.7663 | 5.84 | 2.758 | 22 14.5 | 2 53.4 |
| 6 | .8521 | 41.50 | 1.3039 | 333 46 | 1.2928 | 42 21 | 0.7588 | +5.74 | +2.767 | 22 15.1 | 2 49.4 |
| 7 | .8548 | 41.65 | 1.3049 | 333 54 | 1.2934 | 41 22 | 0.7509 | 5.64 | 2.776 | 22 15.6 | 2 45.4 |
| 8 | .8576 | 41.79 | 1.3059 | 334 2 | 1.2941 | 40 22 | 0.7428 | 5.53 | 2.786 | 22 16.1 | 2 41.5 |
| 9 | .8603 | 41.94 | 1.3069 | 334 10 | 1.2947 | 39 22 | 0.7345 | 5.43 | 2.796 | 22 16.6 | 2 37.5 |
| 10 | .8630 | 42.08 | 1.3079 | 334 18 | 1.2954 | 38 23 | 0.7258 | 5.32 | 2.805 | 22 17.2 | 2 33.5 |
| 11 | .8658 | 42.23 | 1.3090 | 334 25 | 1.2960 | 37 23 | 0.7168 | +5.21 | +2.815 | 22 17.7 | 2 29.5 |
| 12 | .8685 | 42.38 | 1.3100 | 334 33 | 1.2967 | 36 24 | 0.7074 | 5.10 | 2.825 | 22 18.2 | 2 25.6 |
| 13 | .8712 | 42.53 | 1.3111 | 334 41 | 1.2973 | 35 25 | 0.6977 | 4.99 | 2.835 | 22 18.8 | 2 21.7 |
| 14 | .8740 | 42.68 | 1.3122 | 334 49 | 1.2979 | 34 26 | 0.6877 | 4.87 | 2.845 | 22 19.3 | 2 17.7 |
| 15 | .8767 | 42.84 | 1.3133 | 334 57 | 1.2985 | 33 27 | 0.6772 | 4.76 | 2.856 | 22 19.8 | 2 13.8 |
| 16 | .8795 | 42.99 | 1.3144 | 335 5 | 1.2991 | 32 29 | 0.6664 | +4.64 | +2.866 | 22 20.3 | 2 9.9 |
| 17 | .8822 | 43.15 | 1.3155 | 335 13 | 1.2997 | 31 30 | 0.6551 | 4.52 | 2.877 | 22 20.8 | 2 6.0 |
| h 18 | .8849 | 43.31 | 1.3167 | 335 20 | 1.3003 | 30 32 | 0.6434 | 4.40 | 2.887 | 22 21.4 | 2 2.1 |
| (4.0) 19 | .8877 | 43.47 | 1.3178 | 335 28 | 1.3009 | 29 33 | 0.6313 | 4.28 | 2.898 | 22 21.9 | 1 58.2 |
| 20 | .8904 | 43.63 | 1.3190 | 335 36 | 1.3014 | 28 35 | 0.6187 | 4.16 | 2.908 | 22 22.4 | 1 54.3 |
| 21 | .8931 | 43.79 | 1.3201 | 335 43 | 1.3020 | 27 37 | 0.6055 | +4.03 | +2.919 | 22 22.9 | 1 50.5 |
| 22 | .8959 | 43.95 | 1.3213 | 335 51 | 1.3025 | 26 39 | 0.5918 | 3.91 | 2.930 | 22 23.4 | 1 46.6 |
| 23 | .8986 | 44.12 | 1.3225 | 335 58 | 1.3030 | 25 42 | 0.5775 | 3.78 | 2.941 | 22 23.9 | 1 42.8 |
| 24 | .9014 | 44.28 | 1.3237 | 336 6 | 1.3036 | 24 44 | 0.5625 | 3.65 | 2.952 | 22 24.4 | 1 38.9 |
| 25 | .9041 | 44.45 | 1.3250 | 336 13 | 1.3040 | 23 46 | 0.5469 | 3.52 | 2.963 | 22 24.9 | 1 35.1 |
| 26 | .9068 | 44.62 | 1.3262 | 336 21 | 1.3045 | 22 49 | 0.5306 | +3.39 | +2.974 | 22 25.4 | 1 31.3 |
| 27 | .9096 | 44.78 | 1.3274 | 336 28 | 1.3050 | 21 52 | 0.5135 | 3.26 | 2.986 | 22 25.9 | 1 27.5 |
| 28 | .9123 | 44.96 | 1.3287 | 336 35 | 1.3055 | 20 55 | 0.4954 | 3.13 | 2.997 | 22 26.3 | 1 23.6 |
| 29 | .9150 | 45.13 | 1.3300 | 336 42 | 1.3059 | 19 57 | 0.4765 | 3.00 | 3.009 | 22 26.8 | 1 19.8 |
| 30 | .9178 | 45.30 | 1.3312 | 336 49 | 1.3063 | 19 0 | 0.4565 | 2.86 | 3.020 | 22 27.3 | 1 16.0 |
| Dec. 1 | .9205 | 45.47 | 1.3325 | 336 56 | 1.3067 | 18 4 | 0.4355 | +2.73 | +3.032 | 22 27.7 | 1 12.2 |
| 2 | .9233 | 45.65 | 1.3338 | 337 3 | 1.3071 | 17 7 | 0.4133 | 2.59 | 3.043 | 22 28.2 | 1 8.5 |
| 3 | .9260 | 45.82 | 1.3351 | 337 9 | 1.3074 | 16 10 | 0.3897 | 2.45 | 3.055 | 22 28.6 | 1 4.7 |
| h 4 | .9287 | 46.00 | 1.3364 | 337 16 | 1.3078 | 15 13 | 0.3645 | 2.32 | 3.067 | 22 29.1 | 1 0.9 |
| (5.0) 5 | .9315 | 46.18 | 1.3378 | 337 23 | 1.3081 | 14 17 | 0.3377 | 2.18 | 3.078 | 22 29.5 | 0 57.1 |
| 6 | .9342 | 46.35 | 1.3391 | 337 29 | 1.3084 | 13 20 | 0.3088 | +2.04 | +3.090 | 22 29.9 | 0 53.4 |
| 7 | .9370 | 46.53 | 1.3404 | 337 35 | 1.3087 | 12 24 | 0.2778 | 1.90 | 3.102 | 22 30.4 | 0 49.6 |
| 8 | .9397 | 46.71 | 1.3418 | 337 42 | 1.3090 | 11 27 | 0.2445 | 1.76 | 3.114 | 22 30.8 | 0 45.8 |
| 9 | .9424 | 46.89 | 1.3431 | 337 48 | 1.3092 | 10 31 | 0.2082 | 1.62 | 3.126 | 22 31.2 | 0 42.1 |
| 10 | .9452 | 47.07 | 1.3445 | 337 54 | 1.3095 | 9 35 | 0.1682 | 1.47 | 3.138 | 22 31.6 | 0 38.3 |
| 11 | .9479 | 47 25 | 1.3458 | 337 59 | 1.3097 | 8 38 | 0.1238 | +1.33 | +3.150 | 22 32.0 | 0 34.6 |
| 12 | .9506 | 47.43 | 1.3472 | 338 5 | 1.3099 | 7 42 | 0.0744 | 1.19 | 3.162 | 22 32.3 | 0 30.8 |
| 13 | .9534 | 47.61 | 1.3486 | 338 11 | 1.3100 | 6 46 | 0.0187 | 1.04 | 3.174 | 22 32.7 | 0 27.1 |
| 14 | .9561 | 47.80 | 1.3500 | 338 16 | 1.3102 | 5 50 | 9.9547 | 0.90 | 3.187 | 22 33.1 | 0 23.3 |
| 15 | .9589 | 47.98 | 1.3514 | 338 22 | 1.3103 | 4 54 | 9.8791 | 0.76 | 3.199 | 22 33.4 | 0 19.6 |
| 16 | .9616 | 48.16 | 1.3528 | 338 27 | 1.3104 | 3 58 | 9.7875 | +0.61 | +3.211 | 22 33.8 | 0 15.8 |
| 17 | .9643 | 48.35 | 1.3542 | 338 32 | 1.3105 | 3 1 | 9.6712 | 0.47 | 3.223 | 22 34.1 | 0 12.1 |
| 18 | .9671 | 48.53 | 1.3556 | 338 37 | 1.3105 | 2 5 | 9.5105 | 0.32 | 3.236 | 22 34.5 | 0 8.4 |
| h 19 | .9698 | 48.72 | 1.3569 | 338 42 | 1.3106 | 1 9 | 9.2528 | 0.18 | 3.248 | 22 34.8 | 0 4.6 |
| (6.0) 20 | .9725 | 48.90 | 1.3583 | 338 47 | 1.3106 | 0 13 | *p*8.5315 | +0.03 | 3.260 | 22 35.1 | 0 0.9 |
| 21 | .9753 | 49.08 | 1.3597 | 338 51 | 1.3106 | 359 17 | *n*9.1271 | −0.11 | +3.272 | 22 35.4 | 23 57.1 |
| 22 | .9780 | 49.27 | 1.3611 | 338 56 | 1.3106 | 358 21 | 9.4065 | 0.26 | 3.284 | 22 35.7 | 23 53.4 |
| 23 | .9808 | 49.45 | 1.3626 | 339 0 | 1.3105 | 357 25 | 9.6021 | 0.40 | 3.297 | 22 36.0 | 23 49.7 |
| 24 | .9835 | 49.63 | 1.3640 | 339 5 | 1.3104 | 356 29 | 9.7356 | 0.54 | 3.309 | 22 36.3 | 23 45.9 |
| 25 | .9862 | 49.82 | 1.3654 | 339 9 | 1.3104 | 355 33 | 9.8376 | 0.69 | 3.321 | 22 36.6 | 23 42.2 |
| 26 | .9890 | 50.00 | 1.3668 | 339 13 | 1.3102 | 354 36 | *n*9.9201 | 0.83 | 3.333 | 22 36.8 | 23 38.4 |
| 27 | .9917 | 50.18 | 1.3681 | 339 16 | 1.3101 | 353 40 | 9.9894 | −0.98 | +3.345 | 22 37.1 | 23 34.7 |
| 28 | .9944 | 50.37 | 1.3695 | 339 20 | 1.3100 | 352 44 | 0.0492 | 1.12 | 3.358 | 22 37.4 | 23 30.9 |
| 29 | .9972 | 50.55 | 1.3709 | 339 24 | 1.3098 | 351 48 | 0.1017 | 1.26 | 3.370 | 22 37.6 | 23 27.2 |
| 30 | 0.9999 | 50.73 | 1.3723 | 339 27 | 1.3096 | 350 51 | 0.1483 | 1.41 | 3.382 | 22 37.8 | 23 23.4 |
| 31 | 1.0027 | 50.91 | 1.3737 | 339 31 | 1.3094 | 349 55 | 0.1930 | 1.55 | 3.394 | 22 38.1 | 23 19.7 |
| 32 | 1.0054 | +51.09 | 1.3751 | 339 34 | 1.3091 | 348 59 | *n*0.2281 | −1.69 | +3.406 | 22 38.3 | 23 15.9 |

## BESSEL'S FORMULÆ OF REDUCTION FOR THE FIXED STARS,

### WITH DR. PETERS'S COEFFICIENTS, AND BESSEL'S NOTATION.

$A = \tau - 0.34244 \sin \text{☊} + 0.00410 \sin 2\,\text{☊} - 0.02519 \sin 2\odot + 0.00293 \sin (\odot + 82^\circ\, 15')$.

$B = -9''.2238 \cos \text{☊} + 0''.0895 \cos 2\,\text{☊} - 0''.5507 \cos 2\odot - 0''.0092 \cos (\odot + 280^\circ\, 48')$.

$C = -20''.4451 \cos \omega \cos \odot$.

$D = -20''.4451 \sin \odot$.

$E = -0''.0465 \sin \text{☊} + 0''.0014 \sin 2\,\text{☊} - 0''.0033 \sin 2\odot$.

$a = 3^s.07228 + 1^s.33694 \sin \alpha \tan \delta$.

$b = \frac{1}{15} \cos \alpha \tan \delta$.

$c = \frac{1}{15} \cos \alpha \sec \delta$.

$d = \frac{1}{15} \sin \alpha \sec \delta$.

$a' = 20''.0541 \cos \alpha$.

$b' = - \sin \alpha$.

$c' = \tan \omega \cos \delta - \sin \alpha \sin \delta$.

$d' = \cos \alpha \sin \delta$.

$\mu$ = the annual proper motion in right ascension.

$\mu'$ = the annual proper motion in declination.

$\tau$ = the time reckoned from Jan. $0^d$—.711, (when the sun's mean longitude is 280°,) and expressed in fractional parts of a tropical year.

$\odot$ = the sun's true longitude.

☊ = the longitude of the moon's ascending node.

$\omega$ = the obliquity of the ecliptic.

$\alpha$ = the star's mean right ascension for the beginning of the year.

$\delta$ = the star's mean declination for the beginning of the year.

$\alpha'$ = the star's apparent right ascension at the time $\tau$.

$\delta'$ = the star's apparent declination at the time $\tau$.

$\alpha' - \alpha = A a + B b + C c + D d + E + \tau \mu$. (in time)

$\delta' - \delta = A a' + B b' + C c' + D d' + \tau \mu'$. (in arc)

The following formulæ may also be used by putting

$f = 46''.0841\, A + E = 3^s.07228\, A + \frac{1}{15} E$. $\quad i = C \tan \omega$.

$g \cos G = 20''.0541\, A$. $\quad h \sin H = C$.

$g \sin G = B$. $\quad h \cos H = D$.

$\alpha' - \alpha = f + \tau \mu + g \sin (G + \alpha) \frac{\tan \delta}{15} + h \sin (H + \alpha) \frac{\sec \delta}{15}$. (in time)

$\delta' - \delta = \tau \mu' + g \cos (G + \alpha) + h \cos (H + \alpha) \sin \delta + i \cos \delta$. (in arc)

---

A and B include also the following small terms of nutation, the combined values of which in 1876 are given in Table V. of the Appendix.

$\triangle A = +.00025 \sin (2\odot - \text{☊}) + .00009 \sin (2\Gamma' - \text{☊})$.
$\quad + .00010 \sin 2 (\odot - \Gamma') + .00005 \cos \Gamma'$.
$\quad - .00005 \sin 2 (\odot - \text{☊}) + .00004 \sin 2\Gamma'$.
$\quad - .00011 \sin (3\odot + \Gamma)$.

$\triangle B = +0''.0067 \cos (2\odot - \text{☊})$.
$\quad - 0.0027 \cos (3\odot - \Gamma)$.
$\quad + 0.0024 \cos (2\Gamma' - \text{☊})$.
$\quad - 0.0023 \sin \Gamma'$.
$\quad + 0.0008 \sin 2\Gamma'$.

Table IV. of the Appendix contains the following terms:

$A_{\text{☾}} = -.00405 \sin 2\,\text{☾}$. $\quad B_{\text{☾}} = -0''.0885 \cos 2\,\text{☾}$.

$A'_{\text{☾}} = +.00133 \sin (\text{☾} - \Gamma')$.

Tables VI. and VII. facilitate finding the corresponding reductions of Right Ascensions and Declinations. In these terms:

☾ = the moon's mean longitude.

$\Gamma$ = the longitude of the sun's perigee.

$\Gamma'$ = the longitude of the moon's perigee.

Other terms, which become sensible for stars very near the pole, will be found on page 497.

MEAN PLACES FOR 1876.0. (Jan. $0^{d}$—.711, Washington.)

| Star's Name. | Magnitude. | Right Ascension. | An. Variation. | Declination. | An. Variation. |
|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ |
| α Andromedæ . . . | 2 | 0 1 58.822 | + 3.089 | +28 24 21.59 | +19.90 |
| γ Pegasi (*Algenib*) . | 3.2 | 0 6 51.115 | 3.083 | +14 29 39.60 | 20.04 |
| * β Hydri . . . . . | 3 | 0 19 12.141 | 3.250 | −77 57 12.96 | 20.24 |
| α Cassiopeæ . . . | var. | 0 33 28.872 | 3.367 | +55 51 24.85 | 19.80 |
| β Ceti . . . . . | 2 | 0 37 21.820 | 3.014 | −18 40 2.74 | 19.83 |
| *21 Cassiopeæ . . . | 6 | 0 37 29.361 | + 3.836 | +74 18 33.49 | +19.73 |
| ε Piscium . . . . | 4 | 0 56 30.532 | 3.109 | + 7 13 19.94 | 19.47 |
| * α Ursæ Min. (*Polaris*) | 2 | 1 13 21.109 | 21.020 | +88 38 52.85 | 19.03 |
| θ¹ Ceti . . . . . | 3 | 1 17 49.531 | 2.998 | − 8 49 24.25 | 18.72 |
| *38 Cassiopeæ . . . | 6 | 1 22 1.770 | 4.358 | +69 37 31.59 | 18.71 |
| η Piscium . . . . | 4.3 | 1 24 50.922 | + 3.200 | +14 42 22.51 | +18.72 |
| α Eridani (*Achernar*) | 1 | 1 33 5.431 | 2.234 | −57 52 1.01 | 18.41 |
| ο Piscium . . . . | 4 | 1 38 50.883 | 3.162 | + 8 31 58.64 | 18.25 |
| β Arietis . . . . | 3.2 | 1 47 47.539 | 3.302 | +20 12 4.80 | 17.78 |
| *50 Cassiopeæ . . . | 4 | 1 52 52.856 | 4.986 | +71 49 10.45 | 17.67 |
| α Arietis . . . . | 2 | 2 0 11.161 | + 3.369 | +22 52 31.22 | +17.22 |
| ξ¹ Ceti . . . . . | 4.5 | 2 6 25.680 | 3.170 | + 8 15 50.82 | 17.06 |
| * ι Cassiopeæ . . . | 4 | 2 18 52.198 | 4.845 | +66 50 34.66 | 16.46 |
| γ Ceti . . . . . | 3.4 | 2 36 52.600 | 3.103 | + 2 42 44.10 | 15.38 |
| α Ceti . . . . . | 2.3 | 2 55 47.911 | 3.129 | + 3 36 7.28 | 16.35 |
| *48 Cephei (H.) . . . | 6 | 3 4 39.321 | + 7.359 | +77 16 32.04 | +13.82 |
| ζ Arietis . . . . | 4.5 | 3 7 46.581 | 3.438 | +20 35 1.81 | 13.63 |
| α Persei . . . . . | 2 | 3 15 28.618 | 4.250 | +49 25 4.10 | 13.14 |
| δ Persei . . . . . | 3 | 3 34 6.012 | 4.241 | +47 23 19.88 | 11.87 |
| η Tauri . . . . . | 3 | 3 40 6.918 | 3.555 | +23 43 12.39 | 11.44 |
| ζ Persei . . . . . | 3 | 3 46 20.411 | + 3.757 | +31 30 48.87 | +11.02 |
| γ¹ Eridani . . . . | 3 | 3 52 14.660 | 2.797 | −13 51 44.14 | 10.52 |
| γ Tauri . . . . . | 4 | 4 12 44.277 | 3.408 | +15 19 36.16 | 9.04 |
| ε Tauri . . . . . | 4.3 | 4 21 22.628 | 3.496 | +18 54 14.05 | 8.36 |
| α Tauri (*Aldebaran*) . | 1 | 4 28 48.407 | 3.436 | +16 15 30.56 | 7.60 |
| * 9 Camelopardalis . . | 4 | 4 41 43.928 | + 5.916 | +66 7 44.03 | + 6.72 |
| ι Aurigæ . . . . | 3 | 4 48 55.200 | 3.897 | +32 58 4.20 | 6.11 |
| 11 Orionis . . . . | 5 | 4 57 29.123 | 3.426 | +15 13 47.16 | 5.39 |
| α Aurigæ (*Capella*) . | 1 | 5 7 31.866 | 4.423 | +45 52 9.89 | 4.12 |
| β Orionis (*Rigel*) . . | 1 | 5 8 34.741 | 2.881 | − 8 20 47.06 | 4.46 |
| β Tauri . . . . . | 2 | 5 18 27.240 | + 3.788 | +28 30 2.20 | + 3.44 |
| * Groombridge 966 . | 6.7 | 5 23 9.612 | 7.991 | +74 57 24.80 | 3.21 |
| δ Orionis . . . . | 2 | 5 25 40.358 | 3.064 | − 0 23 33.66 | 2.98 |
| α Leporis . . . . | 3 | 5 27 15.760 | 2.647 | −17 54 44.27 | 2.88 |
| ε Orionis . . . . | 2 | 5 29 55.306 | 3.042 | − 1 16 57.85 | 2.63 |
| α Columbæ . . . . | 2 | 5 35 9.613 | + 2.172 | −34 8 28.05 | + 2.15 |
| α Orionis . . . . | var. | 5 48 27.550 | 3.247 | + 7 22 55.97 | + 1.03 |
| *22 Camelopardalis (H.) | 5.4 | 6 5 10.552 | 6.618 | +69 21 35.03 | − 0.56 |
| μ Geminorum . . . | 3 | 6 15 27.559 | 3.633 | +22 34 31.34 | 1.46 |
| α Argus (*Canopus*) . | 1 | 6 21 12.062 | 1.330 | −52 37 43.12 | 1.86 |
| γ Geminorum . . . | 2.3 | 6 30 32.929 | + 3.469 | +16 30 12.38 | − 2.69 |
| α Canis Maj. (*Sirius*) . | 1 | 6 39 40.999 | 2.645 | −16 32 50.29 | 4.67 |
| *51 Cephei (H.) . . . | 5 | 6 41 44.656 | 30.215 | +87 14 0.77 | 3.66 |
| ε Canis Majoris . . | 2.1 | 6 53 45.236 | + 2.359 | −28 48 16.30 | − 4.66 |

* Circumpolar Stars.

## MEAN PLACES FOR 1876.0. (Jan. $0^{d}$—.711, Washington.)

| Star's Name. | Magnitude. | Right Ascension. | An. Variation. | Declination. | An. Variation. |
|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ |
| δ Canis Majoris . . | 2 | 7 3 21.032 | + 2.439 | −26 11 49.67 | − 5.44 |
| δ Geminorum . . . | 3.4 | 7 12 43.025 | 3.591 | +22 12 32.31 | 6.25 |
| * Piazzi vii. 67. . . | 6 | 7 17 57.732 | 6.310 | +68 42 54.96 | 6.77 |
| α Geminor. (*Castor*). | 2.1 | 7 26 40.885 | 3.839 | +32 9 30.39 | 7.49 |
| α Can. Min. (*Procyon*) | 1 | 7 32 48.705 | 3.146 | + 5 32 27.98 | 8.95 |
| β Geminor. (*Pollux*). | 1.2 | 7 37 43.594 | + 3.682 | +28 19 26.67 | − 8.34 |
| φ Geminorum . . . | 5 | 7 45 54.460 | 3.684 | +27 5 6.12 | 8.96 |
| * 3 Ursæ Majoris (H.) . | 6 | 8 0 27.039 | 6.065 | +68 50 9.57 | 10.07 |
| 15 Argus (ι) . . . . | 3 | 8 2 15.882 | 2.556 | −23 56 51.94 | 10.13 |
| ε Hydræ . . . . | 3.4 | 8 40 12.567 | 3.184 | + 6 52 21.84 | 12.93 |
| ι Ursæ Majoris . . | 3 | 8 50 42.567 | + 4.139 | +48 31 36.48 | −13.86 |
| * σ² Ursæ Majoris . . | 5 | 8 59 27.425 | 5.373 | +67 38 7.14 | 14.24 |
| κ Cancri . . . . | 5 | 9 1 1.766 | 3.255 | +11 9 58.57 | 14.22 |
| ι Argus . . . . . | 2 | 9 13 46.157 | 1.601 | −58 45 16.61 | 14.94 |
| * 1 Draconis (H.) . . | 4.5 | 9 19 15.070 | 9.113 | +81 52 18.58 | 15.32 |
| α Hydræ . . . . | 2 | 9 21 29.652 | + 2.949 | − 8 7 18.88 | −15.40 |
| * *d* Ursæ Majoris . . | 5.4 | 9 23 28.960 | 5.424 | +70 22 24.06 | 15.51 |
| θ Ursæ Majoris . . | 3 | 9 24 33.140 | 4.049 | +52 14 28.12 | 16.17 |
| ε Leonis . . . . . | 3 | 9 38 48.639 | 3.419 | +24 20 39.79 | 16.37 |
| μ Leonis . . . . | 4 | 9 45 42.472 | 3.424 | +26 35 24.40 | 16.76 |
| α Leonis (*Regulus*) . | 1.2 | 10 1 46.053 | + 3.203 | +12 34 21.98 | −17.42 |
| * 32 Ursæ Majoris . . | 6 | 10 9 0.453 | 4.436 | +65 43 32.21 | 17.78 |
| γ¹ Leonis . . . . | 2 | 10 13 8.028 | 3.317 | +20 28 6.06 | 18.03 |
| * 9 Draconis (H.) . . | 5.4 | 10 24 30.335 | 5.300 | +76 21 1.64 | 18.37 |
| ρ Leonis. . . . . | 4 | 10 26 16.922 | 3.166 | + 9 56 39.01 | 18.40 |
| η Argus . . . . . | 2 | 10 40 15.222 | + 2.310 | −59 1 55.29 | −18.76 |
| *l* Leonis . . . . | 5 | 10 42 44.291 | 3.159 | +11 12 4.05 | 18.92 |
| α Ursæ Majoris . . | 2 | 10 56 3.590 | 3.757 | +62 25 11.27 | 19.36 |
| δ Leonis . . . . | 2.3 | 11 7 30.765 | 3.202 | +21 12 10.84 | 19.66 |
| δ Crateris . . . . | 3.4 | 11 13 8.557 | 2.996 | −14 6 27.16 | 19.44 |
| τ Leonis . . . . | 5 | 11 21 33.642 | + 3.088 | + 3 32 20.74 | −19.78 |
| * λ Draconis . . . . | 3.4 | 11 24 7.198 | 3.636 | +70 0 53.17 | 19.87 |
| υ Leonis . . . . | 5.4 | 11 30 36.038 | 3.072 | − 0 8 20.71 | 19.14 |
| β Leonis . . . . | 2 | 11 42 44.038 | 3.066 | +15 15 55.77 | 20.09 |
| γ Ursæ Majoris . . | 2.3 | 11 47 18.037 | 3.187 | +54 23 2.97 | 20.02 |
| ο Virginis . . . . | 4 | 11 58 53.575 | + 3.060 | + 9 25 19.12 | −20.02 |
| * 4 Draconis (H.) . . | 5.4 | 12 6 22.276 | 2.902 | +78 18 17.62 | 20.06 |
| * β Chamæleontis . . | 5 | 12 11 5.995 | 3.349 | −78 37 26.21 | 20.04 |
| η Virginis . . . . | 3.4 | 12 13 33.753 | 3.069 | + 0 1 21.59 | 20.03 |
| α¹ Crucis . . . . | 1 | 12 19 42.297 | 3.269 | −62 24 37.76 | 19.93 |
| β Corvi . . . . . | 2.3 | 12 27 52.572 | + 3.139 | −22 42 37.03 | −19.94 |
| * κ Draconis . . . . | 3.4 | 12 28 10.891 | 2.600 | +70 28 17.52 | 19.93 |
| * 32 Camelop. (H.) (*foll.*) | 5.4 | 12 48 14.155 | 0.364 | +84 5 11.37 | 19.63 |
| 12 Canum Venaticorum. | 3 | 12 50 13.502 | 2.816 | +38 59 18.85 | 19.51 |
| θ Virginis . . . . | 4.5 | 13 3 31.885 | 3.101 | − 4 52 34.55 | 19.31 |
| α Virginis (*Spica*) . | 1 | 13 18 39.755 | + 3.154 | −10 30 47.50 | −18.90 |
| ζ Virginis . . . . | 3.4 | 13 28 22.549 | 3.053 | + 0 2 20.73 | 18.51 |
| η Ursæ Majoris . . | 2 | 13 42 39.229 | 2.374 | +49 55 57.86 | 18.10 |
| η Bootis . . . . . | 3 | 13 48 46.880 | 2.859 | +19 1 13.40 | 18.17 |
| β Centauri . . . . | 1 | 13 55 5.240 | + 4.167 | −59 46 25.54 | −17.64 |

* Circumpolar Stars.

## MEAN PLACES FOR 1876.0. (Jan. $0^{\mathrm{d}}$—.711, Washington.)

| Star's Name. | Magnitude. | Right Ascension. | An. Variation. | Declination. | An. Variation. |
|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | |
| * α Draconis . . . . | 3.4 | 14 1 2.003 | + 1.623 | +64 58 6.24 | −17.35 |
| α Bootis (*Arcturus*) . | 1 | 14 10 0.348 | + 2.734 | +19 49 45.22 | 18.88 |
| θ Bootis . . . . . | 4.3 | 14 20 58.487 | + 2.043 | +52 25 28.89 | 16.77 |
| * 5 Ursæ Minoris . . | 5.4 | 14 27 48.570 | − 0.206 | +76 14 48.35 | 16.04 |
| $\alpha^2$ Centauri . . . . | 1 | 14 31 12.466 | + 4.036 | −60 19 9.68 | 15.03 |
| ε Bootis . . . . . | 2.3 | 14 39 34.332 | + 2.621 | +27 35 53.38 | −15.36 |
| $\alpha^2$ Libræ . . . . . | 2.3 | 14 44 1.242 | + 3.308 | −15 31 29.68 | 15.19 |
| * β Ursæ Minoris . . | 2 | 14 51 5.152 | − 0.244 | +74 39 42.59 | 14.75 |
| β Bootis . . . . . | 3 | 14 57 16.508 | + 2.260 | +40 52 50.22 | 14.38 |
| β Libræ . . . . . | 2 | 15 10 20.156 | + 3.220 | − 8 55 25.04 | 13.53 |
| $\mu^1$ Bootis . . . . . | 4.3 | 15 19 48.431 | + 2.268 | +37 48 47.48 | −12.80 |
| * $\gamma^2$ Ursæ Minoris . . | 3 | 15 20 56.349 | − 0.144 | +72 16 31.33 | 12.80 |
| α Coronæ Borealis . | 2 | 15 29 26.293 | + 2.539 | +27 8 0.37 | 12.32 |
| α Serpentis . . . . | 2.3 | 15 38 9.639 | + 2.950 | + 6 49 2.57 | 11.57 |
| ε Serpentis . . . . | 3.4 | 15 44 38.164 | + 2.987 | + 4 51 9.20 | 11.09 |
| * ζ Ursæ Minoris . . | 4.5 | 15 48 31.643 | + 2.278 | +78 10 29.99 | −10.88 |
| ε Coronæ Borealis . | 4 | 15 52 27.354 | + 2.484 | +27 14 18.71 | 10.63 |
| δ Scorpii . . . . | 2.3 | 15 53 0.209 | + 3.537 | −22 15 59.23 | 10.55 |
| $\beta^1$ Scorpii . . . . | 2 | 15 58 13.697 | + 3.478 | −19 27 51.09 | 10.18 |
| * Groombridge 2320 . | 6.5 | 16 5 59.262 | + 0.135 | +68 8 12.95 | 9.50 |
| δ Ophiuchi . . . . | 3 | 16 7 50.892 | + 3.138 | − 3 22 23.12 | − 9.55 |
| τ Herculis . . . . | 3.4 | 16 16 0.711 | + 1.798 | +46 36 34.37 | 8.76 |
| α Scorpii (*Antares*) . | 1.2 | 16 21 48.424 | + 3.670 | −26 9 16.90 | 8.35 |
| η Draconis . . . . | 3.2 | 16 22 18.988 | + 0.805 | +61 47 42.88 | 8.22 |
| * A Draconis . . . . | 5 | 16 28 14.101 | − 0.140 | +69 2 10.89 | 7.78 |
| ζ Ophiuchi . . . . | 3.2 | 16 30 19.919 | + 3.298 | −10 18 49.51 | − 7.60 |
| * α Trianguli Australis . | 2 | 16 35 33.262 | + 6.288 | −68 47 48.05 | 7.30 |
| η Herculis . . . . | 3 | 16 38 38.717 | + 2.054 | +39 9 34.31 | 7.03 |
| κ Ophiuchi . . . . | 3.4 | 16 51 47.912 | + 2.835 | + 9 34 11.03 | 5.86 |
| *d* Herculis . . . . | 5 | 16 57 1.535 | + 2.209 | +33 44 57.83 | 5.41 |
| * ε Ursæ Minoris . . | 4.5 | 16 58 44.532 | − 6.373 | +82 14 17.47 | − 5.29 |
| $\alpha^1$ Herculis . . . . | var. | 17 8 59.614 | + 2.733 | +14 32 0.44 | 4.37 |
| 44 Ophiuchi . . . . | 5 | 17 18 47.896 | + 3.659 | −24 3 30.49 | 3.67 |
| β Draconis . . . . | 3.2 | 17 27 37.829 | + 1.351 | +52 23 37.50 | 2.81 |
| α Ophiuchi . . . . | 2 | 17 29 10.700 | + 2.783 | +12 39 7.64 | 2.90 |
| * ω Draconis . . . . | 5 | 17 37 40.765 | − 0.355 | +68 48 52.29 | − 1.65 |
| μ Herculis . . . . | 3.4 | 17 41 36.357 | + 2.345 | +27 47 41.34 | 2.32 |
| * $\psi^1$ Draconis (*pr.*) . . | 4.5 | 17 44 8.803 | − 1.082 | +72 12 33.16 | 1.65 |
| γ Draconis . . . . | 2.3 | 17 53 43.764 | + 1.394 | +51 30 14.85 | 0.58 |
| $\gamma^2$ Sagittarii . . . . | 3.4 | 17 57 50.577 | + 3.852 | −30 25 24.11 | − 0.41 |
| $\mu^1$ Sagittarii . . . . | 4 | 18 6 20.857 | + 3.586 | −21 5 20.43 | + 0.56 |
| * δ Ursæ Minoris . . | 4.5 | 18 12 19.895 | −19.424 | +86 36 28.55 | 1.12 |
| η Serpentis . . . . | 3 | 18 14 53.545 | + 3.099 | − 2 55 43.95 | 0.63 |
| * σ Octantis . . . . | 6 | 18 17 12.758 | +108.692 | −89 16 36.69 | 1.51 |
| 1 Aquilæ (3 H. Scuti) | 4.5 | 18 28 27.490 | + 3.265 | − 8 19 43.11 | 2.18 |
| α Lyræ (*Vega*) . . | 1 | 18 32 44.401 | + 2.031 | +38 40 9.78 | + 3.14 |
| β Lyræ . . . . . | var. | 18 45 30.097 | + 2.215 | +33 13 11.69 | 3.94 |
| σ Sagittarii . . . | 2.3 | 18 47 34.562 | + 3.724 | −26 26 53.80 | 4.07 |
| * 50 Draconis . . . . | 6 | 18 50 21.720 | − 1.901 | +75 17 10.92 | 4.43 |
| ζ Aquilæ . . . . | 3 | 18 59 42.560 | + 2.754 | +13 40 51.21 | + 5.08 |

* Circumpolar Stars.

## MEAN PLACES FOR 1876.0. (Jan. 0ᵈ—.711, Washington.)

| Star's Name. | Magnitude. | Right Ascension. | An. Variation. | Declination. | An. Variation. |
|---|---|---|---|---|---|
| | | h m s | s | ° ′ ″ | ″ |
| d Sagittarii | 5 | 19 10 22.719 | + 3.513 | −19 10 14.50 | + 6.11 |
| * δ Draconis | 3 | 19 12 31.305 | + 0.033 | +67 26 35.68 | 6.31 |
| * τ Draconis | 5 | 19 17 55.607 | − 1.109 | +73 7 28.15 | 6.79 |
| δ Aquilæ | 3.4 | 19 19 14.706 | + 3.025 | + 2 52 9.85 | 6.89 |
| κ Aquilæ | 5 | 19 30 13.153 | + 3.230 | − 7 18 3.45 | 7.72 |
| γ Aquilæ | 3 | 19 40 21.850 | + 2.853 | +10 18 45.56 | + 8.51 |
| α Aquilæ (*Altair*) | 1.2 | 19 44 43.957 | + 2.928 | + 8 32 32.69 | 9.24 |
| * λ Ursæ Minoris | 6.7 | 19 48 16.936 | −60.951 | +88 56 0.07 | 9.12 |
| * ε Draconis | 4 | 19 48 34.925 | − 0.174 | +69 57 6.12 | 9.15 |
| β Aquilæ | 4 | 19 49 13.297 | + 2.947 | + 6 5 55.22 | 8.73 |
| τ Aquilæ | 6.5 | 19 58 4.933 | + 2.933 | + 6 55 46.80 | + 9.90 |
| α² Capricorni | 3.4 | 20 11 10.368 | + 3.333 | −12 55 38.84 | 10.88 |
| * κ Cephei | 4.5 | 20 13 1.733 | − 1.901 | +77 20 12.15 | 11.00 |
| α Pavonis | 2 | 20 15 49.948 | + 4.792 | −57 7 46.67 | 11.17 |
| π Capricorni | 5 | 20 20 13.305 | + 3.441 | −18 36 58.94 | 11.49 |
| ε Delphini | 4 | 20 27 17.287 | + 2.866 | +10 52 59.60 | +12.00 |
| * Groombridge 3241 | 6.7 | 20 30 31.679 | − 0.211 | +72 6 41.54 | 12.23 |
| α Cygni | 2.1 | 20 37 12.280 | + 2.044 | +44 50 16.87 | 12.70 |
| μ Aquarii | 5.4 | 20 45 57.816 | + 3.240 | − 9 26 48.82 | 13.27 |
| ν Cygni | 4 | 20 52 33.016 | + 2.234 | +40 41 27.55 | 13.73 |
| * 12 Year Cat. 1879 | 6 | 20 53 9.056 | + 2.505 | +80 5 9.22 | +13.70 |
| 61 Cygni (*pr.*) | 5.6 | 21 1 20.421 | 2.688 | +38 8 26.77 | 17.51 |
| ζ Cygni | 3 | 21 7 39.528 | 2.551 | +29 43 9.58 | 14.59 |
| α Cephei | 3.2 | 21 15 37.140 | 1.437 | +62 3 36.66 | 15.12 |
| 1 Pegasi | 4.5 | 21 16 21.183 | 2.775 | +19 16 31.23 | 15.24 |
| β Aquarii | 3 | 21 25 1.818 | + 3.164 | − 6 6 55.04 | +15.65 |
| * β Cephei | 3 | 21 27 3.157 | 0.799 | +70 0 58.34 | 15.72 |
| ξ Aquarii | 5.4 | 21 31 8.956 | 3.198 | − 8 24 32.52 | 15.96 |
| ε Pegasi | 2.3 | 21 38 5.767 | 2.948 | + 9 18 27.37 | 16.34 |
| * 11 Cephei | 5 | 21 40 5.987 | 0.905 | +70 44 25.55 | 16.50 |
| μ Capricorni | 5 | 21 46 32.052 | + 3.279 | −14 8 2.35 | +16.78 |
| * 79 Draconis | 6.7 | 21 51 19.386 | 0.735 | +73 6 56.18 | 16.97 |
| α Aquarii | 3 | 21 59 24.864 | 3.083 | − 0 55 16.66 | 17.34 |
| α Gruis | 2 | 22 0 24.624 | 3.812 | −47 33 36.80 | 17.20 |
| θ Aquarii | 4.5 | 22 10 17.361 | 3.170 | − 8 23 59.28 | 17.79 |
| π Aquarii | 5.4 | 22 18 56.635 | + 3.065 | + 0 44 56.24 | +18.14 |
| η Aquarii | 4.3 | 22 28 59.020 | 3.083 | − 0 45 21.07 | 18.44 |
| *226 Cephei (B.) | 5.6 | 22 30 5.424 | 1.082 | +75 35 14.42 | 18.52 |
| ζ Pegasi | 3.4 | 22 35 16.602 | 2.989 | +10 11 5.67 | 18.71 |
| * ι Cephei | 4.3 | 22 45 16.116 | 2.119 | +56 32 54.18 | 18.86 |
| λ Aquarii | 4 | 22 46 8.609 | + 3.131 | − 8 14 19.04 | +19.08 |
| α Pis. Aus. (*Fomalhaut*) | 1.2 | 22 50 47.706 | 3.328 | −30 16 43.23 | 19.00 |
| α Pegasi (*Markab*) | 2 | 22 58 35.088 | 2.995 | +14 32 19.62 | 19.32 |
| * ο Cephei | 6.5 | 23 13 32.488 | 2.438 | +67 25 58.27 | 19.66 |
| θ Piscium | 4.5 | 23 21 40.662 | 3.041 | + 5 41 54.42 | 19.75 |
| ι Piscium | 4.5 | 23 33 34.413 | + 3.084 | + 4 57 16.36 | +19.49 |
| * γ Cephei | 3.4 | 23 34 16.217 | 2.405 | +76 56 25.22 | 20.08 |
| * Groombridge 4163 | 7 | 23 48 49.179 | 2.853 | +73 43 12.28 | 20.00 |
| ω Piscium | 4 | 23 52 56.675 | + 3.078 | + 6 10 37.28 | +19.94 |

* Circumpolar Stars.

## APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*,) FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | JANUARY. | | Mean Solar Date. | FEBRUARY. | | Mean Solar Date. | MARCH. | | Mean Solar Date. | APRIL. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* |
| | h m<br>1 12 | ° ′<br>+88 39 | | h m<br>1 12 | ° ′<br>+88 39 | | h m<br>1 12 | ° ′<br>+88 39 | | h m<br>1 12 | ° ′<br>+88 38 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 0.3 | 66.83 | 15.5 | 1.2 | 38.03 | 15.8 | 1.1 | 17.05 | 10.8 | 1.0 | 7.69 | 62.1 |
| 1.3 | 65.86 | 15.6 | 2.2 | 37.28 | 15.7 | 2.1 | 16.61 | 10.5 | 2.0 | 7.62 | 61.8 |
| 2.3 | 64.92 | 15.7 | 3.2 | 36.54 | 15.6 | 3.1 | 16.17 | 10.3 | 3.0 | 7.52 | 61.6 |
| 3.3 | 64.02 | 15.8 | 4.2 | 35.80 | 15.5 | 4.1 | 15.70 | 10.1 | 4.0 | 7.42 | 61.3 |
| 4.3 | 63.18 | 15.8 | 5.2 | 35.05 | 15.4 | 5.1 | 15.19 | 9.9 | 5.0 | 7.33 | 61.0 |
| 5.3 | 62.37 | 15.9 | 6.2 | 34.26 | 15.4 | 6.1 | 14.66 | 9.7 | 6.0 | 7.27 | 60.6 |
| 6.3 | 61.58 | 16.0 | 7.2 | 33.41 | 15.3 | 7.1 | 14.10 | 9.5 | 7.0 | 7.26 | 60.3 |
| 7.2 | 60.79 | 16.0 | 8.2 | 32.53 | 15.2 | 8.1 | 13.53 | 9.2 | 8.0 | 7.32 | 60.0 |
| 8.2 | 59.99 | 16.1 | 9.2 | 31.62 | 15.1 | 9.1 | 12.98 | 8.9 | 9.0 | 7.44 | 59.6 |
| 9.2 | 59.15 | 16.2 | 10.2 | 30.70 | 14.9 | 10.1 | 12.47 | 8.6 | 10.0 | 7.62 | 59.3 |
| 10.2 | 58.25 | 16.3 | 11.2 | 29.82 | 14.7 | 11.1 | 12.02 | 8.3 | 11.0 | 7.84 | 59.0 |
| 11.2 | 57.30 | 16.4 | 12.1 | 28.98 | 14.6 | 12.1 | 11.63 | 8.0 | 12.0 | 8.08 | 58.7 |
| 12.2 | 56.30 | 16.5 | 13.1 | 28.19 | 14.4 | 13.1 | 11.30 | 7.7 | 13.0 | 8.32 | 58.4 |
| 13.2 | 55.28 | 16.5 | 14.1 | 27.46 | 14.2 | 14.1 | 11.03 | 7.4 | 14.0 | 8.54 | 58.0 |
| 14.2 | 54.26 | 16.6 | 15.1 | 26.79 | 14.0 | 15.1 | 10.79 | 7.1 | 15.0 | 8.72 | 57.8 |
| 15.2 | 53.27 | 16.6 | 16.1 | 26.16 | 13.8 | 16.1 | 10.56 | 6.8 | 16.0 | 8.86 | 57.6 |
| 16.2 | 52.31 | 16.5 | 17.1 | 25.54 | 13.6 | 17.1 | 10.32 | 6.5 | 17.0 | 8.99 | 57.3 |
| 17.2 | 51.40 | 16.5 | 18.1 | 24.91 | 13.4 | 18.1 | 10.04 | 6.3 | 18.0 | 9.12 | 57.0 |
| 18.2 | 50.53 | 16.5 | 19.1 | 24.25 | 13.2 | 19.1 | 9.72 | 6.0 | 19.0 | 9.26 | 56.7 |
| 19.2 | 49.70 | 16.5 | 20.1 | 23.55 | 13.1 | 20.1 | 9.39 | 5.7 | 20.0 | 9.44 | 56.4 |
| 20.2 | 48.89 | 16.4 | 21.1 | 22.82 | 12.9 | 21.0 | 9.05 | 5.5 | 21.0 | 9.69 | 56.1 |
| 21.2 | 48.08 | 16.4 | 22.1 | 22.07 | 12.7 | 22.0 | 8.70 | 5.2 | 22.0 | 10.00 | 55.8 |
| 22.2 | 47.25 | 16.4 | 23.1 | 21.30 | 12.5 | 23.0 | 8.38 | 4.8 | 23.0 | 10.37 | 55.4 |
| 23.2 | 46.38 | 16.4 | 24.1 | 20.54 | 12.3 | 24.0 | 8.12 | 4.5 | 24.0 | 10.80 | 55.1 |
| 24.2 | 45.47 | 16.4 | 25.1 | 19.81 | 12.1 | 25.0 | 7.92 | 4.2 | 25.0 | 11.27 | 54.9 |
| 25.2 | 44.52 | 16.4 | 26.1 | 19.14 | 11.8 | 26.0 | 7.79 | 3.8 | 25.9 | 11.75 | 54.6 |
| 26.2 | 43.54 | 16.4 | 27.1 | 18.53 | 11.5 | 27.0 | 7.73 | 3.5 | 26.9 | 12.22 | 54.4 |
| 27.2 | 42.54 | 16.3 | 28.1 | 17.99 | 11.3 | 28.0 | 7.71 | 3.2 | 27.9 | 12.66 | 54.2 |
| 28.2 | 41.54 | 16.2 | 29.1 | 17.50 | 11.0 | 29.0 | 7.71 | 2.9 | 28.9 | 13.06 | 53.9 |
| 29.2 | 40.57 | 16.1 | 30.1 | 17.05 | 10.8 | 30.0 | 7.72 | 2.6 | 29.9 | 13.42 | 53.7 |
| 30.2 | 39.66 | 16.0 | 31.1 | 16.61 | 10.5 | 31.0 | 7.72 | 2.3 | 30.9 | 13.77 | 53.5 |
| 31.2 | 38.82 | 15.9 | 32.1 | 16.17 | 10.3 | 32.0 | 7.69 | 2.1 | 31.9 | 14.11 | 53.2 |

## APPARENT PLACES OF α URSÆ MINORIS, (*Polaris,*) FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | MAY. | | Mean Solar Date. | JUNE. | | Mean Solar Date. | JULY. | | Mean Solar Date. | AUGUST. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* |
| | h m<br>1 12 | ° ′<br>+88 38 | | h m<br>1 12 | ° ′<br>+88 38 | | h m<br>1 13 | ° ′<br>+88 38 | | h m<br>1 13 | ° ′<br>+88 38 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 1.9 | 14.11 | 53.2 | 1.8 | 34.23 | 47.1 | 1.8 | 1.22 | 45.8 | 1.7 | 29.79 | 49.7 |
| 2.9 | 14.47 | 53.0 | 2.8 | 35.10 | 47.0 | 2.8 | 2.26 | 45.9 | 2.7 | 30.62 | 49.9 |
| 3.9 | 14.88 | 52.7 | 3.8 | 36.01 | 46.8 | 3.8 | 3.29 | 45.9 | 3.7 | 31.39 | 50.2 |
| 4.9 | 15.35 | 52.4 | 4.8 | 36.94 | 46.7 | 4.8 | 4.29 | 46.0 | 4.7 | 32.13 | 50.4 |
| 5.9 | 15.89 | 52.1 | 5.8 | 37.87 | 46.6 | 5.8 | 5.24 | 46.1 | 5.7 | 32.86 | 50.6 |
| 6.9 | 16.49 | 51.8 | 6.8 | 38.79 | 46.5 | 6.8 | 6.13 | 46.2 | 6.7 | 33.58 | 50.8 |
| 7.9 | 17.13 | 51.6 | 7.8 | 39.67 | 46.5 | 7.8 | 6.97 | 46.3 | 7.7 | 34.33 | 51.0 |
| 8.9 | 17.78 | 51.3 | 8.8 | 40.51 | 46.4 | 8.7 | 7.79 | 46.4 | 8.7 | 35.12 | 51.2 |
| 9.9 | 18.43 | 51.1 | 9.8 | 41.32 | 46.4 | 9.7 | 8.63 | 46.5 | 9.7 | 35.95 | 51.4 |
| 10.9 | 19.07 | 50.9 | 10.8 | 42.10 | 46.3 | 10.7 | 9.47 | 46.5 | 10.7 | 36.83 | 51.6 |
| 11.9 | 19.68 | 50.7 | 11.8 | 42.87 | 46.2 | 11.7 | 10.35 | 46.6 | 11.7 | 37.74 | 51.9 |
| 12.9 | 20.25 | 50.5 | 12.8 | 43.64 | 46.1 | 12.7 | 11.28 | 46.6 | 12.7 | 38.65 | 52.1 |
| 13.9 | 20.79 | 50.3 | 13.8 | 44.45 | 46.0 | 13.7 | 12.26 | 46.7 | 13.6 | 39.53 | 52.4 |
| 14.9 | 21.31 | 50.1 | 14.8 | 45.30 | 46.0 | 14.7 | 13.28 | 46.8 | 14.6 | 40.37 | 52.7 |
| 15.9 | 21.84 | 49.9 | 15.8 | 46.21 | 45.9 | 15.7 | 14.31 | 46.9 | 15.6 | 41.16 | 53.0 |
| 16.9 | 22.39 | 49.7 | 16.8 | 47.18 | 45.8 | 16.7 | 15.36 | 47.1 | 16.6 | 41.88 | 53.3 |
| 17.9 | 22.99 | 49.5 | 17.8 | 48.19 | 45.8 | 17.7 | 16.37 | 47.2 | 17.6 | 42.55 | 53.6 |
| 18.9 | 23.66 | 49.3 | 18.8 | 49.21 | 45.7 | 18.7 | 17.34 | 47.4 | 18.6 | 43.18 | 53.9 |
| 19.9 | 24.39 | 49.1 | 19.8 | 50.23 | 45.7 | 19.7 | 18.26 | 47.5 | 19.6 | 43.80 | 54.2 |
| 20.9 | 25.18 | 48.9 | 20.8 | 51.23 | 45.7 | 20.7 | 19.14 | 47.7 | 20.6 | 44.43 | 54.4 |
| 21.9 | 26.00 | 48.7 | 21.8 | 52.19 | 45.8 | 21.7 | 19.96 | 47.9 | 21.6 | 45.08 | 54.7 |
| 22.9 | 26.82 | 48.5 | 22.8 | 53.09 | 45.8 | 22.7 | 20.75 | 48.1 | 22.6 | 45.77 | 54.9 |
| 23.9 | 27.64 | 48.3 | 23.8 | 53.94 | 45.8 | 23.7 | 21.54 | 48.2 | 23.6 | 46.50 | 55.2 |
| 24.9 | 28.44 | 48.2 | 24.8 | 54.77 | 45.8 | 24.7 | 22.36 | 48.3 | 24.6 | 47.28 | 55.4 |
| 25.9 | 29.21 | 48.1 | 25.8 | 55.59 | 45.9 | 25.7 | 23.22 | 48.5 | 25.6 | 48.06 | 55.7 |
| 26.9 | 29.93 | 48.0 | 26.8 | 56.43 | 45.9 | 26.7 | 24.13 | 48.6 | 26.6 | 48.83 | 56.0 |
| 27.9 | 30.61 | 47.9 | 27.8 | 57.30 | 45.8 | 27.7 | 25.07 | 48.7 | 27.6 | 49.57 | 56.4 |
| 28.9 | 31.28 | 47.7 | 28.8 | 58.21 | 45.8 | 28.7 | 26.04 | 48.9 | 28.6 | 50.26 | 56.7 |
| 29.9 | 31.96 | 47.6 | 29.8 | 59.18 | 45.8 | 29.7 | 27.02 | 49.1 | 29.6 | 50.88 | 57.0 |
| 30.9 | 32.67 | 47.5 | 30.8 | 60.19 | 45.8 | 30.7 | 27.99 | 49.3 | 30.6 | 51.45 | 57.4 |
| 31.8 | 33.42 | 47.3 | 31.8 | 61.22 | 45.8 | 31.7 | 28.92 | 49.5 | 31.6 | 51.97 | 57.7 |
| 32.8 | 34.23 | 47.1 | 32.8 | 62.26 | 45.9 | 32.7 | 29.79 | 49.7 | 32.6 | 52.47 | 58.1 |

## APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*,) FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | SEPTEMBER. | | Mean Solar Date. | OCTOBER. | | Mean Solar Date. | NOVEMBER. | | Mean Solar Date. | DECEMBER. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* |
| | h m<br>1 13 | ° ′<br>+88 38 | | h m<br>1 14 | ° ′<br>+88 39 | | h m<br>1 13 | ° ′<br>+88 39 | | h m<br>1 13 | ° ′<br>+88 39 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 1.6 | 52.47 | 58.1 | 1.5 | 5.06 | 8.7 | 1.4 | 65.86 | 20.6 | 1.3 | 53.69 | 30.6 |
| 2.6 | 52.96 | 58.4 | 2.5 | 5.28 | 9.1 | 2.4 | 65.77 | 21.0 | 2.3 | 53.13 | 30.9 |
| 3.6 | 53.46 | 58.7 | 3.5 | 5.55 | 9.5 | 3.4 | 65.64 | 21.4 | 3.3 | 52.50 | 31.2 |
| 4.6 | 53.98 | 59.0 | 4.5 | 5.84 | 9.8 | 4.4 | 65.47 | 21.8 | 4.3 | 51.80 | 31.5 |
| 5.6 | 54.54 | 59.3 | 5.5 | 6.14 | 10.2 | 5.4 | 65.25 | 22.2 | 5.3 | 51.05 | 31.8 |
| 6.6 | 55.15 | 59.6 | 6.5 | 6.43 | 10.6 | 6.4 | 64.96 | 22.6 | 6.3 | 50.28 | 32.1 |
| 7.6 | 55.79 | 59.9 | 7.5 | 6.67 | 11.0 | 7.4 | 64.61 | 23.0 | 7.3 | 49.51 | 32.3 |
| 8.6 | 56.44 | 60.2 | 8.5 | 6.88 | 11.4 | 8.4 | 64.22 | 23.3 | 8.3 | 48.75 | 32.5 |
| 9.6 | 57.07 | 60.6 | 9.5 | 7.04 | 11.9 | 9.4 | 63.80 | 23.7 | 9.3 | 48.01 | 32.7 |
| 10.6 | 57.66 | 61.0 | 10.5 | 7.13 | 12.3 | 10.4 | 63.38 | 24.0 | 10.3 | 47.31 | 32.9 |
| 11.6 | 58.20 | 61.4 | 11.5 | 7.16 | 12.7 | 11.4 | 62.98 | 24.4 | 11.3 | 46.64 | 33.1 |
| 12.6 | 58.68 | 61.7 | 12.5 | 7.15 | 13.1 | 12.4 | 62.60 | 24.7 | 12.3 | 46.00 | 33.3 |
| 13.6 | 59.10 | 62.1 | 13.5 | 7.12 | 13.5 | 13.4 | 62.27 | 25.0 | 13.3 | 45.36 | 33.6 |
| 14.6 | 59.47 | 62.5 | 14.5 | 7.10 | 13.9 | 14.4 | 61.96 | 25.3 | 14.3 | 44.71 | 33.8 |
| 15.6 | 59.81 | 62.9 | 15.5 | 7.11 | 14.2 | 15.4 | 61.66 | 25.6 | 15.3 | 44.03 | 34.0 |
| 16.6 | 60.14 | 63.2 | 16.5 | 7.15 | 14.6 | 16.4 | 61.35 | 25.9 | 16.3 | 43.29 | 34.3 |
| 17.6 | 60.49 | 63.6 | 17.5 | 7.22 | 14.9 | 17.4 | 61.02 | 26.3 | 17.3 | 42.48 | 34.5 |
| 18.5 | 60.88 | 63.9 | 18.5 | 7.31 | 15.3 | 18.4 | 60.63 | 26.6 | 18.3 | 41.62 | 34.7 |
| 19.5 | 61.30 | 64.2 | 19.5 | 7.40 | 15.7 | 19.4 | 60.18 | 27.0 | 19.3 | 40.73 | 34.9 |
| 20.5 | 61.75 | 64.5 | 20.5 | 7.48 | 16.1 | 20.4 | 59.67 | 27.3 | 20.3 | 39.82 | 35.1 |
| 21.5 | 62.22 | 64.9 | 21.5 | 7.51 | 16.5 | 21.4 | 59.10 | 27.7 | 21.3 | 38.91 | 35.2 |
| 22.5 | 62.69 | 65.3 | 22.5 | 7.49 | 16.9 | 22.4 | 58.50 | 28.0 | 22.3 | 38.01 | 35.4 |
| 23.5 | 63.13 | 65.7 | 23.5 | 7.42 | 17.3 | 23.4 | 57.89 | 28.3 | 23.3 | 37.16 | 35.5 |
| 24.5 | 63.53 | 66.1 | 24.5 | 7.28 | 17.7 | 24.4 | 57.28 | 28.6 | 24.3 | 36.36 | 35.6 |
| 25.5 | 63.88 | 66.5 | 25.4 | 7.08 | 18.1 | 25.4 | 56.69 | 28.9 | 25.3 | 35.60 | 35.7 |
| 26.5 | 64.16 | 66.9 | 26.4 | 6.84 | 18.5 | 26.4 | 56.14 | 29.1 | 26.3 | 34.86 | 35.9 |
| 27.5 | 64.38 | 67.3 | 27.4 | 6.62 | 18.9 | 27.4 | 55.63 | 29.4 | 27.3 | 34.13 | 36.0 |
| 28.5 | 64.56 | 67.7 | 28.4 | 6.40 | 19.2 | 28.4 | 55.15 | 29.7 | 28.3 | 33.38 | 36.2 |
| 29.5 | 64.72 | 68.0 | 29.4 | 6.20 | 19.5 | 29.4 | 54.68 | 30.0 | 29.3 | 32.59 | 36.3 |
| 30.5 | 64.88 | 68.4 | 30.4 | 6.05 | 19.9 | 30.4 | 54.20 | 30.3 | 30.3 | 31.75 | 36.5 |
| 31.5 | 65.06 | 68.7 | 31.4 | 5.94 | 20.2 | 31.3 | 53.69 | 30.6 | 31.3 | 30.85 | 36.6 |
| 32.5 | 65.28 | 69.1 | 32.4 | 5.86 | 20.6 | 32.3 | 53.13 | 30.9 | 32.3 | 29.90 | 36.8 |

## APPARENT PLACES OF 51 CEPHEI, (*Hev.*,) FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | JANUARY. | | Mean Solar Date. | FEBRUARY. | | Mean Solar Date. | MARCH. | | Mean Solar Date. | APRIL. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* |
| | h m<br>6 42 | ° ′<br>+87 14 | | h m<br>6 42 | ° ′<br>+87 14 | | h m<br>6 41 | ° ′<br>+87 14 | | h m<br>6 41 | ° ′<br>+87 14 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 0.5 | 14.76 | 8.9 | 1.4 | 13.59 | 18.9 | 1.3 | 65.63 | 25.5 | 1.2 | 53.34 | 27.7 |
| 1.5 | 14.82 | 9.2 | 2.4 | 13.41 | 19.1 | 2.3 | 65.30 | 25.6 | 2.2 | 52.98 | 27.6 |
| 2.5 | 14.87 | 9.5 | 3.4 | 13.25 | 19.3 | 3.3 | 64.99 | 25.7 | 3.2 | 52.60 | 27.6 |
| 3.5 | 14.92 | 9.8 | 4 4 | 13.11 | 19.6 | 4.3 | 64.68 | 25.9 | 4.2 | 52.20 | 27.6 |
| 4.5 | 14.97 | 10.1 | 5.4 | 12.97 | 19.8 | 5.3 | 64.37 | 26.0 | 5.2 | 51.77 | 27.6 |
| 5.5 | 15.03 | 10.4 | 6.4 | 12.82 | 20.1 | 6.3 | 64.04 | 26.2 | 6.2 | 51.32 | 27.6 |
| 6.5 | 15.10 | 10.7 | 7.4 | 12.67 | 20.4 | 7.3 | 63.68 | 26.4 | 7.2 | 50.86 | 27.6 |
| 7.5 | 15.18 | 11.0 | 8.4 | 12.49 | 20.7 | 8.3 | 63.29 | 26.5 | 8.2 | 50.39 | 27.5 |
| 8.5 | 15.27 | 11.3 | 9.4 | 12.28 | 21.0 | 9.3 | 62.87 | 26.7 | 9.2 | 49.94 | 27.4 |
| 9.5 | 15.38 | 11.6 | 10.4 | 12.03 | 21.3 | 10.3 | 62.43 | 26.8 | 10.2 | 49.51 | 27.3 |
| 10.5 | 15.48 | 11.9 | 11.4 | 11.75 | 21.6 | 11.3 | 61.97 | 26.9 | 11.2 | 49.10 | 27.2 |
| 11.5 | 15.55 | 12.3 | 12.4 | 11.44 | 21.8 | 12.3 | 61.52 | 27.0 | 12.2 | 48.71 | 27.1 |
| 12.5 | 15.58 | 12.6 | 13.4 | 11.13 | 22.1 | 13.3 | 61.07 | 27.1 | 13.2 | 48.35 | 27.0 |
| 13.5 | 15.59 | 13.0 | 14.4 | 10.81 | 22.3 | 14.3 | 60.64 | 27.1 | 14.2 | 48.00 | 26.9 |
| 14.5 | 15.55 | 13.4 | 15.4 | 10.50 | 22.5 | 15.3 | 60.24 | 27.2 | 15.2 | 47.65 | 26.8 |
| 15.4 | 15.49 | 13.7 | 16.4 | 10.21 | 22.7 | 16.3 | 59.86 | 27.2 | 16.2 | 47.30 | 26.7 |
| 16.4 | 15.41 | 14.0 | 17.4 | 9.94 | 22.9 | 17.3 | 59.50 | 27.3 | 17.2 | 46.94 | 26.6 |
| 17.4 | 15.32 | 14.3 | 18.4 | 9.68 | 23.1 | 18.3 | 59.14 | 27.4 | 18.2 | 46.55 | 26.5 |
| 18.4 | 15.23 | 14.6 | 19.4 | 9.42 | 23.3 | 19.3 | 58.77 | 27.4 | 19.2 | 46.14 | 26.4 |
| 19.4 | 15.15 | 14.9 | 20.4 | 9.16 | 23.5 | 20.3 | 58.38 | 27.5 | 20.2 | 45.72 | 26.3 |
| 20.4 | 15.08 | 15.2 | 21.4 | 8.89 | 23.8 | 21.3 | 57.97 | 27.6 | 21.2 | 45.29 | 26.2 |
| 21.4 | 15.02 | 15.5 | 22.3 | 8.60 | 24.0 | 22.3 | 57.53 | 27.6 | 22.2 | 44.87 | 26.1 |
| 22.4 | 14.98 | 15.8 | 23.3 | 8.28 | 24.2 | 23.3 | 57.07 | 27.6 | 23.2 | 44.48 | 25.9 |
| 23.4 | 14.94 | 16.1 | 24.3 | 7.92 | 24.5 | 24.3 | 56.60 | 27.6 | 24.2 | 44.12 | 25.7 |
| 24.4 | 14.88 | 16.4 | 25.3 | 7.53 | 24.7 | 25.3 | 56.13 | 27.7 | 25.2 | 43.79 | 25.5 |
| 25.4 | 14.81 | 16.7 | 26.3 | 7.14 | 24.9 | 26.3 | 55.67 | 27.7 | 26.2 | 43.47 | 25.3 |
| 26.4 | 14.70 | 17.1 | 27.3 | 6.74 | 25.1 | 27.3 | 55.23 | 27.8 | 27.2 | 43.18 | 25.1 |
| 27.4 | 14.56 | 17.4 | 28.3 | 6.35 | 25.2 | 28.3 | 54.81 | 27.8 | 28.2 | 42.91 | 24.9 |
| 28.4 | 14.39 | 17.7 | 29.3 | 5.98 | 25.4 | 29.3 | 54.42 | 27.7 | 20.2 | 42.65 | 24.8 |
| 29.4 | 14.20 | 18.0 | 30.3 | 5.63 | 25.5 | 30.2 | 54.05 | 27.7 | 30.2 | 42.37 | 24.6 |
| 30.4 | 13.99 | 18.3 | 31.3 | 5.30 | 25.6 | 31.2 | 53.69 | 27.7 | 31.2 | 42.07 | 24.5 |
| 31.4 | 13.79 | 18.6 | 32.3 | 4.99 | 25.7 | 32.2 | 53.34 | 27.7 | 32.2 | 41.74 | 24.3 |

## APPARENT PLACES OF 51 CEPHEI, (*Hev.*,) FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | MAY. | | Mean Solar Date. | JUNE. | | Mean Solar Date. | JULY. | | Mean Solar Date. | AUGUST. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* |
| | h m<br>6 41 | ° ′<br>+87 14 | | h m<br>6 41 | ° ′<br>+87 14 | | h m<br>6 41 | ° ′<br>+87 13 | | h m<br>6 41 | ° ′<br>+87 13 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 1.2 | 42.07 | 24.5 | 1.1 | 35.08 | 17.0 | 1.0 | 35.04 | 67.7 | 1.9 | 42.64 | 58.2 |
| 2.2 | 41.74 | 24.3 | 2.1 | 34.92 | 16.7 | 2.0 | 35.15 | 67.4 | 2.9 | 43.02 | 57.9 |
| 3.2 | 41.40 | 24.2 | 3.1 | 34.77 | 16.4 | 3.0 | 35.30 | 67.0 | 3.9 | 43.40 | 57.7 |
| 4.2 | 41.05 | 24.0 | 4.1 | 34.64 | 16.1 | 4.0 | 35.47 | 66.7 | 4.9 | 43.76 | 57.5 |
| 5.2 | 40.69 | 23.8 | 5.1 | 34.55 | 15.7 | 5.0 | 35.65 | 66.4 | 5.9 | 44.10 | 57.3 |
| 6.1 | 40.34 | 23.6 | 6.1 | 34.50 | 15.4 | 6.0 | 35.84 | 66.0 | 6.9 | 44.42 | 57.1 |
| 7.1 | 40.01 | 23.3 | 7.1 | 34.47 | 15.1 | 7.0 | 36.04 | 65.7 | 7.9 | 44.74 | 56.8 |
| 8.1 | 39.71 | 22.1 | 8.1 | 34.45 | 14.8 | 8.0 | 36.23 | 65.5 | 8.9 | 45.07 | 56.6 |
| 9.1 | 39.45 | 22.8 | 9.1 | 34.44 | 14.5 | 9.0 | 36.41 | 65.2 | 9.9 | 45.41 | 56.3 |
| 10.1 | 39.21 | 22.6 | 10.1 | 34.42 | 14.2 | 10.0 | 36.57 | 64.9 | 10.9 | 45.76 | 56.0 |
| 11.1 | 38.99 | 22.4 | 11.0 | 34.39 | 13.9 | 11.0 | 36.72 | 64.7 | 11.9 | 46.14 | 55.8 |
| 12.1 | 38.78 | 22.1 | 12.0 | 34.34 | 13.7 | 12.0 | 36.86 | 64.4 | 12.9 | 46.56 | 55.5 |
| 13.1 | 38.57 | 21.9 | 13.0 | 34.27 | 13.4 | 13.0 | 37.01 | 64.1 | 13.9 | 47.02 | 55.2 |
| 14.1 | 38.35 | 21.7 | 14.0 | 34.20 | 13.1 | 14.0 | 37.18 | 63.7 | 14.9 | 47.49 | 55.0 |
| 15.1 | 38.11 | 21.5 | 15.0 | 34.13 | 12.8 | 15.0 | 37.38 | 63.4 | 15.9 | 47.97 | 54.8 |
| 16.1 | 37.86 | 21.3 | 16.0 | 34.08 | 12.5 | 16.0 | 37.62 | 63.0 | 16.9 | 48.45 | 54.6 |
| 17.1 | 37.59 | 21.1 | 17.0 | 34.06 | 12.1 | 17.0 | 37.89 | 62.7 | 17.9 | 48.91 | 54.4 |
| 18.1 | 37.31 | 20.9 | 18.0 | 34.07 | 11.8 | 17.9 | 38.18 | 62.4 | 18.9 | 49.34 | 54.2 |
| 19.1 | 37.05 | 20.6 | 19.0 | 34.11 | 11.4 | 18.9 | 38.49 | 62.1 | 19.9 | 49.76 | 54.0 |
| 20.1 | 36.81 | 20.3 | 20.0 | 34.19 | 11.1 | 19.9 | 38.81 | 61.8 | 20.9 | 50.16 | 53.9 |
| 21.1 | 36.59 | 20.0 | 21.0 | 34.29 | 10.7 | 20.9 | 39.12 | 61.5 | 21.9 | 50.55 | 53.7 |
| 22.1 | 36.41 | 19.7 | 22.0 | 34.40 | 10.4 | 21.9 | 39.41 | 61.3 | 22.9 | 50.94 | 53.5 |
| 23.1 | 36.26 | 19.4 | 23.0 | 34.51 | 10.1 | 22.9 | 39.68 | 61.0 | 23.8 | 51.34 | 53.2 |
| 24.1 | 36.13 | 19.1 | 24.0 | 34.62 | 9.8 | 23.9 | 39.93 | 60.8 | 24.8 | 51.76 | 53.0 |
| 25.1 | 36.02 | 18.8 | 25.0 | 34.71 | 9.6 | 24.9 | 40.18 | 60.5 | 25.8 | 52.21 | 52.8 |
| 26.1 | 35.92 | 18.6 | 26.0 | 34.77 | 9.3 | 25.9 | 40.42 | 60.2 | 26.8 | 52.69 | 52.6 |
| 27.1 | 35.82 | 18.3 | 27.0 | 34.81 | 9.0 | 26.9 | 40.66 | 59.9 | 27.8 | 53.19 | 52.4 |
| 28.1 | 35.71 | 18.1 | 28.0 | 34.85 | 8.7 | 27.9 | 40.92 | 59.6 | 28.8 | 53.71 | 52.2 |
| 29.1 | 35.58 | 17.8 | 29.0 | 34.90 | 8.4 | 28.9 | 41.21 | 59.3 | 29.8 | 54.23 | 52.0 |
| 30.1 | 35.42 | 17.6 | 30.0 | 34.96 | 8.0 | 29.9 | 41.54 | 59.0 | 30.8 | 54.75 | 51.9 |
| 31.1 | 35.25 | 17.3 | 31.0 | 35.04 | 7.7 | 30.9 | 41.89 | 58.7 | 31.8 | 55.25 | 51.7 |
| 32.1 | 35.08 | 17.0 | 32.0 | 35.15 | 7.4 | 31.9 | 42.26 | 58.4 | 32.8 | 55.72 | 51.6 |

## APPARENT PLACES OF 51 CEPHEI, (*Hev.*,) FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | SEPTEMBER. | | Mean Solar Date. | OCTOBER. | | Mean Solar Date. | NOVEMBER. | | Mean Solar Date. | DECEMBER. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination North. | | Right Ascension. | Declination North. | | Right Ascension. | Declination North. | | Right Ascension. | Declination North. |
| | h m<br>6 41 | ° ′<br>+87 13 | | h m<br>6 42 | ° ′<br>+87 13 | | h m<br>6 42 | ° ′<br>+87 13 | | h m<br>6 42 | ° ′<br>+87 13 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 1.8 | 55.72 | 51.6 | 1.7 | 11.38 | 48.8 | 1.7 | 27.89 | 50.2 | 1.6 | 41.13 | 55.8 |
| 2.8 | 56.17 | 51.5 | 2.7 | 11.88 | 48.8 | 2.7 | 28.41 | 50.3 | 2.6 | 41.54 | 56.0 |
| 3.8 | 56.61 | 51.4 | 3.7 | 12.39 | 48.7 | 3.7 | 28.95 | 50.4 | 3.6 | 41.94 | 56.3 |
| 4.8 | 57.06 | 51.2 | 4.7 | 12.92 | 48.7 | 4.6 | 29.50 | 50.5 | 4.6 | 42.32 | 56.6 |
| 5.8 | 57.51 | 51.1 | 5.7 | 13.47 | 48.6 | 5.6 | 30.06 | 50.6 | 5.6 | 42.68 | 56.9 |
| 6.8 | 57.97 | 50.9 | 6.7 | 14.04 | 48.6 | 6.6 | 30.61 | 50.8 | 6.6 | 43.01 | 57.2 |
| 7.8 | 58.46 | 50.7 | 7.7 | 14.64 | 48.6 | 7.6 | 31.14 | 50.9 | 7.6 | 43.30 | 57.5 |
| 8.8 | 58.99 | 50.5 | 8.7 | 15.26 | 48.6 | 8.6 | 31.64 | 51.1 | 8.6 | 43.56 | 57.8 |
| 9.8 | 59.55 | 50.4 | 9.7 | 15.87 | 48.6 | 9.6 | 32.10 | 51.3 | 9.5 | 43.80 | 58.0 |
| 10.8 | 60.12 | 50.2 | 10.7 | 16.47 | 48.6 | 10.6 | 32.54 | 51.5 | 10.5 | 44.03 | 58.3 |
| 11.8 | 60.70 | 50.1 | 11.7 | 17.05 | 48.7 | 11.6 | 32.96 | 51.7 | 11.5 | 44.27 | 58.5 |
| 12.8 | 61.28 | 50.0 | 12.7 | 17.60 | 48.7 | 12.6 | 33.37 | 51.9 | 12.5 | 44.53 | 58.8 |
| 13.8 | 61.85 | 49.9 | 13.7 | 18.12 | 48.8 | 13.6 | 33.78 | 52.0 | 13.5 | 44.81 | 59.0 |
| 14.8 | 62.40 | 49.9 | 14:7 | 18.62 | 48.8 | 14.6 | 34.20 | 52.2 | 14.5 | 45.10 | 59.3 |
| 15.8 | 62.92 | 49.8 | 15.7 | 19.11 | 48.9 | 15.6 | 34.64 | 52.3 | 15.5 | 45.39 | 59.6 |
| 16.8 | 63.42 | 49.7 | 16.7 | 19.60 | 48.9 | 16.6 | 35.10 | 52.5 | 16.5 | 45.68 | 59.9 |
| 17.8 | 63.91 | 49.6 | 17.7 | 20.10 | 48.9 | 17.6 | 35.57 | 52.6 | 17.5 | 45.95 | 60.2 |
| 18.8 | 64.39 | 49.6 | 18.7 | 20.61 | 48.9 | 18.6 | 36.05 | 52.8 | 18.5 | 46.20 | 60.5 |
| 19.8 | 64.87 | 49.5 | 19.7 | 21.14 | 49.0 | 19.6 | 36.53 | 53.0 | 19.5 | 46.42 | 60.8 |
| 20.8 | 65.36 | 49.3 | 20.7 | 21.70 | 49.0 | 20.6 | 37.00 | 53.3 | 20.5 | 46.61 | 61.2 |
| 21.8 | 65.88 | 49.2 | 21.7 | 22.28 | 49.0 | 21.6 | 37.44 | 53.5 | 21.5 | 46.77 | 61.5 |
| 22.8 | 66.43 | 49.1 | 22.7 | 22.86 | 49.1 | 22.6 | 37.84 | 53.8 | 22.5 | 46.91 | 61.8 |
| 23.8 | 67.01 | 49.0 | 23.7 | 23.43 | 49.2 | 23.6 | 38.21 | 54.0 | 23.5 | 47.04 | 62.1 |
| 24.8 | 67.59 | 48.9 | 24.7 | 23.99 | 49.3 | 24.6 | 38.57 | 54.3 | 24.5 | 47.17 | 62.4 |
| 25.7 | 68.18 | 48.9 | 25.7 | 24.53 | 49.4 | 25.6 | 38.91 | 54.5 | 25.5 | 47.31 | 62.7 |
| 26.7 | 68.76 | 48.9 | 26.7 | 25.03 | 49.6 | 26.6 | 39.24 | 54.8 | 26.5 | 47.46 | 63.0 |
| 27.7 | 69.33 | 48.8 | 27.7 | 25.51 | 49.7 | 27.6 | 39.58 | 55.0 | 27.5 | 47.63 | 63.2 |
| 28.7 | 69.87 | 48.8 | 28.7 | 25.98 | 49.8 | 28.6 | 39.94 | 55.2 | 28.5 | 47.81 | 63.5 |
| 29.7 | 70.39 | 48.8 | 29.7 | 26.44 | 49.9 | 29.6 | 40.32 | 55.4 | 29.5 | 48.00 | 63.8 |
| 30.7 | 70.89 | 48.8 | 30.7 | 26.91 | 50.0 | 30.6 | 40.72 | 55.6 | 30.5 | 48.19 | 64.2 |
| 31.7 | 71.38 | 48.8 | 31.7 | 27.39 | 50.1 | 31.6 | 41.13 | 55.8 | 31.5 | 48.37 | 64.5 |
| 32.7 | 71.88 | 48.8 | 32.7 | 27.89 | 50.2 | 32.6 | 41.54 | 56.0 | 32.5 | 48.52 | 64.9 |

## APPARENT PLACES OF δ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | JANUARY. | | Mean Solar Date. | FEBRUARY. | | Mean Solar Date. | MARCH. | | Mean Solar Date. | APRIL. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination North. | | Right Ascension. | Declination North. | | Right Ascension. | Declination North. | | Right Ascension. | Declination North. |
| | h m<br>18 11 | ° ′<br>+86 36 | | h m<br>18 11 | ° ′<br>+86 36 | | h m<br>18 12 | ° ′<br>+86 35 | | h m<br>18 12 | ° ′<br>+86 36 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 1.0 | 56.72 | 17.4 | 1.9 | 59.83 | 7.2 | 1.8 | 7.76 | 61.3 | 1.7 | 18.42 | 0.4 |
| 2.0 | 56.73 | 17.0 | 2.9 | 60.03 | 7.0 | 2.8 | 8.06 | 61.2 | 2.7 | 18.74 | 0.4 |
| 3.0 | 56.75 | 16.7 | 3.9 | 60.22 | 6.7 | 3.8 | 8.35 | 61.1 | 3.7 | 19.07 | 0.4 |
| 4.0 | 56.78 | 16.4 | 4.9 | 60.40 | 6.5 | 4.8 | 8.65 | 61.0 | 4.7 | 19.41 | 0.5 |
| 5.0 | 56.80 | 16.1 | 5.9 | 60.58 | 6.3 | 5.8 | 8.95 | 60.8 | 5.7 | 19.77 | 0.5 |
| 6.0 | 56.82 | 15.8 | 6.9 | 60.77 | 6.0 | 6.8 | 9.26 | 60.7 | 6.7 | 20.14 | 0.6 |
| 7.0 | 56.83 | 15.5 | 7.9 | 60.97 | 5.7 | 7.8 | 9.60 | 60.6 | 7.7 | 20.51 | 0.7 |
| 8.0 | 56.83 | 15.2 | 8.9 | 61.19 | 5.4 | 8.8 | 9.96 | 60.5 | 8.7 | 20.87 | 0.8 |
| 9.0 | 56.82 | 14.8 | 9.9 | 61.44 | 5.2 | 9.8 | 10.33 | 60.4 | 9.7 | 21.22 | 1.0 |
| 9.9 | 56.83 | 14.5 | 10.9 | 61.71 | 4.9 | 10.8 | 10.71 | 60.3 | 10.7 | 21.56 | 1.2 |
| 10.9 | 56.84 | 14.1 | 11.9 | 61.99 | 4.6 | 11.8 | 11.09 | 60.2 | 11.7 | 21.88 | 1.3 |
| 11.9 | 56.87 | 13.8 | 12.9 | 62.28 | 4.4 | 12.8 | 11.47 | 60.2 | 12.7 | 22.18 | 1.5 |
| 12.9 | 56.92 | 13.4 | 13.9 | 62.58 | 4.2 | 13.8 | 11.84 | 60.1 | 13.7 | 22.47 | 1.6 |
| 13.9 | 57.00 | 13.0 | 14.9 | 62.87 | 4.0 | 14.8 | 12.20 | 60.1 | 14.7 | 22.76 | 1.8 |
| 14.9 | 57.10 | 12.7 | 15.9 | 63.16 | 3.8 | 15.8 | 12.54 | 60.1 | 15.7 | 23.04 | 1.9 |
| 15.9 | 57.22 | 12.3 | 16.9 | 63.44 | 3.7 | 16.8 | 12.87 | 60.1 | 16.7 | 23.33 | 2.0 |
| 16.9 | 57.35 | 12.0 | 17.9 | 63.71 | 3.5 | 17.8 | 13.19 | 60.1 | 17.7 | 23.64 | 2.2 |
| 17.9 | 57.48 | 11.7 | 18.8 | 63.97 | 3.3 | 18.8 | 13.52 | 60.0 | 18.7 | 23.97 | 2.3 |
| 18.9 | 57.60 | 11.4 | 19.8 | 64.23 | 3.1 | 19.8 | 13.85 | 60.0 | 19.7 | 24.30 | 2.4 |
| 19.9 | 57.72 | 11.2 | 20.8 | 64.50 | 2.9 | 20.8 | 14.20 | 60.0 | 20.7 | 24.63 | 2.5 |
| 20.9 | 57.88 | 10.9 | 21.8 | 64.78 | 2.7 | 21.8 | 14.57 | 59.9 | 21.7 | 24.95 | 2.7 |
| 21.9 | 57.94 | 10.6 | 22.8 | 65.08 | 2.5 | 22.8 | 14.95 | 59.9 | 22.7 | 25.26 | 2.9 |
| 22.9 | 58.05 | 10.3 | 23.8 | 65.40 | 2.3 | 23.8 | 15.34 | 59.9 | 23.7 | 25.55 | 3.1 |
| 23.9 | 58.17 | 10.0 | 24.8 | 65.74 | 2.1 | 24.8 | 15.72 | 59.9 | 24.7 | 25.82 | 3.4 |
| 24.9 | 58.29 | 9.6 | 25.8 | 66.09 | 1.9 | 25.7 | 16.10 | 59.9 | 25.7 | 26.07 | 3.6 |
| 25.9 | 58.43 | 9.3 | 26.8 | 66.44 | 1.7 | 26.7 | 16.47 | 60.0 | 26.7 | 26.30 | 3.8 |
| 26.9 | 58.59 | 9.0 | 27.8 | 66.78 | 1.6 | 27.7 | 16.83 | 60.0 | 27.7 | 26.53 | 4.0 |
| 27.9 | 58.77 | 8.6 | 28.8 | 67.12 | 1.5 | 28.7 | 17.17 | 60.1 | 28.7 | 26.76 | 4.2 |
| 28.9 | 58.98 | 8.3 | 29.8 | 67.45 | 1.4 | 29.7 | 17.49 | 60.2 | 29.6 | 26.99 | 4.4 |
| 29.9 | 59.20 | 8.0 | 30.8 | 67.76 | 1.3 | 30.7 | 17.80 | 60.3 | 30.6 | 27.22 | 4.6 |
| 30.9 | 59.42 | 7.8 | 31.8 | 68.06 | 1.2 | 31.7 | 18.11 | 60.3 | 31.6 | 27.46 | 4.8 |
| 31.9 | 59.63 | 7.5 | 32.8 | 68.35 | 1.1 | 32.7 | 18.42 | 60.4 | 32.6 | 27.71 | 5.0 |

## APPARENT PLACES OF δ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | MAY. | | Mean Solar Date. | JUNE. | | Mean Solar Date. | JULY. | | Mean Solar Date. | AUGUST. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* |
| | h m<br>18 12 | ° ′<br>+86 36 | | h m<br>18 12 | ° ′<br>+86 36 | | h m<br>18 12 | ° ′<br>+86 36 | | h m<br>18 12 | ° ′<br>+86 36 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 1.6 | 27.46 | 4.8 | 1.6 | 32.47 | 13.3 | 1.5 | 31.63 | 23.0 | 1.4 | 24.94 | 31.9 |
| 2.6 | 27.71 | 5.0 | 2.6 | 32.57 | 13.7 | 2.5 | 31.50 | 23.4 | 2.4 | 24.61 | 32.2 |
| 3.6 | 27.97 | 5.2 | 3.6 | 32.65 | 14.0 | 3.5 | 31.35 | 23.7 | 3.4 | 24.29 | 32.4 |
| 4.6 | 28.23 | 5.4 | 4.6 | 32.71 | 14.4 | 4.5 | 31.19 | 24.1 | 4.4 | 23.98 | 32.6 |
| 5.6 | 28.50 | 5.7 | 5.6 | 32.74 | 14.7 | 5.5 | 31.02 | 24.4 | 5.4 | 23.68 | 32.8 |
| 6.6 | 28.75 | 6.0 | 6.6 | 32.75 | 15.1 | 6.5 | 30.84 | 24.7 | 6.4 | 23.39 | 33.0 |
| 7.6 | 28.98 | 6.2 | 7.6 | 32.75 | 15.4 | 7.5 | 30.67 | 24.9 | 7.4 | 23.10 | 33.2 |
| 8.6 | 29.19 | 6.5 | 8.5 | 32.75 | 15.7 | 8.5 | 30.50 | 25.2 | 8.4 | 22.82 | 33.4 |
| 9.6 | 29.38 | 6.8 | 9.5 | 32.74 | 16.0 | 9.5 | 30.34 | 25.5 | 9.4 | 22.53 | 33.6 |
| 10.6 | 29.55 | 7.1 | 10.5 | 32.74 | 16.3 | 10.5 | 30.19 | 25.7 | 10.4 | 22.22 | 33.8 |
| 11.6 | 29.72 | 7.4 | 11.5 | 32.76 | 16.6 | 11.5 | 30.05 | 26.0 | 11.4 | 21.89 | 34.1 |
| 12.6 | 29.88 | 7.6 | 12.5 | 32.78 | 16.9 | 12.5 | 29.90 | 26.3 | 12.4 | 21.54 | 34.3 |
| 13.6 | 30.05 | 7.8 | 13.5 | 32.81 | 17.2 | 13.4 | 29.73 | 26.6 | 13.4 | 21.17 | 34.6 |
| 14.6 | 30.22 | 8.1 | 14.5 | 32.82 | 17.5 | 14.4 | 29.54 | 27.0 | 14.4 | 20.79 | 34.8 |
| 15.6 | 30.40 | 8.3 | 15.5 | 32.83 | 17.8 | 15.4 | 29.34 | 27.3 | 15.4 | 20.40 | 35.0 |
| 16.6 | 30.59 | 8.6 | 16.5 | 32.83 | 18.2 | 16.4 | 29.12 | 27.6 | 16.4 | 20.01 | 35.2 |
| 17.6 | 30.78 | 8.8 | 17.5 | 32.81 | 18.5 | 17.4 | 28.87 | 27.9 | 17.3 | 19.62 | 35.3 |
| 18.6 | 30.97 | 9.1 | 18.5 | 32.77 | 18.9 | 18.4 | 28.61 | 28.2 | 18.3 | 19.24 | 35.5 |
| 19.6 | 31.15 | 9.4 | 19.5 | 32.70 | 19.2 | 19.4 | 28.34 | 28.5 | 19.3 | 18.88 | 35.6 |
| 20.6 | 31.32 | 9.7 | 20.5 | 32.61 | 19.6 | 20.4 | 28.07 | 28.8 | 20.3 | 18.54 | 35.7 |
| 21.6 | 31.46 | 10.1 | 21.5 | 32.51 | 19.9 | 21.4 | 27.81 | 29.0 | 21.3 | 18.20 | 35.9 |
| 22.6 | 31.57 | 10.4 | 22.5 | 32.40 | 20.2 | 22.4 | 27.56 | 29.2 | 22.3 | 17.86 | 36.1 |
| 23.6 | 31.66 | 10.7 | 23.5 | 32.30 | 20.5 | 23.4 | 27.32 | 29.5 | 23.3 | 17.51 | 36.2 |
| 24.6 | 31.74 | 11.0 | 24.5 | 32.21 | 20.8 | 24.4 | 27.08 | 29.7 | 24.3 | 17.15 | 36.4 |
| 25.6 | 31.82 | 11.3 | 25.5 | 32.13 | 21.1 | 25.4 | 26.85 | 30.0 | 25.3 | 16.78 | 36.6 |
| 26.6 | 31.90 | 11.6 | 26.5 | 32.06 | 21.4 | 26.4 | 26.62 | 30.2 | 26.3 | 16.39 | 36.8 |
| 27.6 | 31.98 | 11.9 | 27.5 | 31.99 | 21.7 | 27.4 | 26.38 | 30.5 | 27.3 | 15.98 | 37.0 |
| 28.6 | 32.06 | 12.2 | 28.5 | 31.91 | 22.0 | 28.4 | 26.13 | 30.8 | 28.3 | 15.56 | 37.2 |
| 29.6 | 32.15 | 12.4 | 29.5 | 31.83 | 22.3 | 29.4 | 25.86 | 31.1 | 29.3 | 15.13 | 37.3 |
| 30.6 | 32.25 | 12.7 | 30.5 | 31.74 | 22.7 | 30.4 | 25.57 | 31.4 | 30.3 | 14.70 | 37.4 |
| 31.6 | 32.36 | 13.0 | 31.5 | 31.63 | 23.0 | 31.4 | 25.26 | 31.7 | 31.3 | 14.28 | 37.5 |
| 32.6 | 32.47 | 13.3 | 32.5 | 31.50 | 23.4 | 32.4 | 24.94 | 31.9 | 32.3 | 13.88 | 37.6 |

## APPARENT PLACES OF δ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | SEPTEMBER. | | Mean Solar Date. | OCTOBER. | | Mean Solar Date. | NOVEMBER. | | Mean Solar Date. | DECEMBER. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* |
| | h m<br>18 12 | +86° 36′ | | h m<br>18 11 | +86° 36′ | | h m<br>18 11 | +86° 36′ | | h m<br>18 11 | +86° 36′ |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 1.3 | 13.88 | 37.6 | 1.2 | 61.14 | 39.0 | 1.1 | 48.40 | 35.9 | 1.1 | 39.07 | 28.8 |
| 2.3 | 13.50 | 37.7 | 2.2 | 60.75 | 39.0 | 2.1 | 48.02 | 35.8 | 2.1 | 38.80 | 28.6 |
| 3.3 | 13.13 | 37.7 | 3.2 | 60.35 | 39.0 | 3.1 | 47.63 | 35.6 | 3.1 | 38.54 | 28.3 |
| 4.3 | 12.75 | 37.8 | 4.2 | 59.93 | 39.0 | 4.1 | 47.23 | 35.5 | 4.1 | 38.29 | 27.9 |
| 5.3 | 12.36 | 37.9 | 5.2 | 59.50 | 38.9 | 5.1 | 46.83 | 35.3 | 5.1 | 38.06 | 27.6 |
| 6.3 | 11.96 | 38.1 | 6.2 | 59.05 | 38.9 | 6.1 | 46.43 | 35.1 | 6.1 | 37.85 | 27.2 |
| 7.3 | 11.56 | 38.2 | 7.2 | 58.59 | 38.9 | 7.1 | 46.04 | 34.9 | 7.0 | 37.66 | 26.9 |
| 8.3 | 11.14 | 38.3 | 8.2 | 58.12 | 38.9 | 8.1 | 45.67 | 34.6 | 8.0 | 37.49 | 26.6 |
| 9.3 | 10.70 | 38.5 | 9.2 | 57.64 | 38.8 | 9.1 | 45.33 | 34.4 | 9.0 | 37.34 | 26.2 |
| 10.3 | 10.25 | 38.6 | 10.2 | 57.17 | 38.7 | 10.1 | 45.01 | 34.1 | 10.0 | 37.20 | 25.9 |
| 11.3 | 9.79 | 38.7 | 11.2 | 56.72 | 38.6 | 11.1 | 44.70 | 33.8 | 11.0 | 37.06 | 25.6 |
| 12.3 | 9.32 | 38.7 | 12.2 | 56.29 | 38.5 | 12.1 | 44.39 | 33.6 | 12.0 | 36.91 | 25.4 |
| 13.3 | 8.86 | 38.8 | 13.2 | 55.88 | 38.4 | 13.1 | 44.09 | 33.4 | 13.0 | 36.76 | 25.1 |
| 14.3 | 8.41 | 38.8 | 14.2 | 55.49 | 38.3 | 14.1 | 43.79 | 33.2 | 14.0 | 36.60 | 24.8 |
| 15.3 | 7.98 | 38.8 | 15.2 | 55.07 | 38.2 | 15.1 | 43.48 | 33.0 | 15.0 | 36.44 | 24.5 |
| 16.3 | 7.57 | 38.8 | 16.2 | 54.68 | 38.1 | 16.1 | 43.16 | 32.8 | 16.0 | 36.28 | 24.2 |
| 17.3 | 7.16 | 38.9 | 17.2 | 54.29 | 38.0 | 17.1 | 42.83 | 32.6 | 17.0 | 36.13 | 23.8 |
| 18.3 | 6.76 | 38.9 | 18.2 | 53.89 | 37.9 | 18.1 | 42.50 | 32.4 | 18.0 | 35.99 | 23.5 |
| 19.3 | 6.36 | 38.9 | 19.2 | 53.49 | 37.9 | 19.1 | 42.17 | 32.1 | 19.0 | 35.87 | 23.1 |
| 20.3 | 5.95 | 39.0 | 20.2 | 53.08 | 37.8 | 20.1 | 41.85 | 31.9 | 20.0 | 35.78 | 22.7 |
| 21.3 | 5.53 | 39.1 | 21.2 | 52.65 | 37.7 | 21.1 | 41.54 | 31.6 | 21.0 | 35.71 | 22.4 |
| 22.3 | 5.10 | 39.1 | 22.2 | 52.22 | 37.6 | 22.1 | 41.25 | 31.3 | 22.0 | 35.65 | 22.0 |
| 23.3 | 4.65 | 39.2 | 23.2 | 51.79 | 37.4 | 23.1 | 40.99 | 31.0 | 23.0 | 35.61 | 21.7 |
| 24.3 | 4.19 | 39.2 | 24.2 | 51.37 | 37.3 | 24.1 | 40.74 | 30.7 | 24.0 | 35.57 | 21.4 |
| 25.2 | 3.72 | 39.2 | 25.2 | 50.96 | 37.1 | 25.1 | 40.51 | 30.4 | 25.0 | 35.51 | 21.1 |
| 26.2 | 3.26 | 39.2 | 26.2 | 50.57 | 36.9 | 26.1 | 40.29 | 30.1 | 26.0 | 35.45 | 20.8 |
| 27.2 | 2.81 | 39.2 | 27.2 | 50.19 | 36.7 | 27.1 | 40.06 | 29.9 | 27.0 | 35.40 | 20.5 |
| 28.2 | 2.37 | 39.1 | 28.2 | 49.83 | 36.5 | 28.1 | 39.82 | 29.6 | 28.0 | 35.31 | 20.2 |
| 29.2 | 1.95 | 39.1 | 29.2 | 49.48 | 36.4 | 29.1 | 39.58 | 29.4 | 29.0 | 35.24 | 19.8 |
| 30.2 | 1.54 | 39.0 | 30.2 | 49.13 | 36.2 | 30.1 | 39.33 | 29.1 | 30.0 | 35.16 | 19.5 |
| 31.2 | 1.14 | 39.0 | 31.1 | 48.77 | 36.1 | 31.1 | 39.07 | 28.8 | 31.0 | 35.11 | 19.1 |
| 32.2 | 0.75 | 39.0 | 32.1 | 48.40 | 35.9 | 32.1 | 38.80 | 28.6 | 32.0 | 35.06 | 18.8 |

## APPARENT PLACES OF λ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | JANUARY. | | Mean Solar Date. | FEBRUARY. | | Mean Solar Date. | MARCH. | | Mean Solar Date. | APRIL. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* |
| | h m<br>19 46 | ° ′<br>+88 55 | | h m<br>19 46 | ° ′<br>+88 55 | | h m<br>19 47 | ° ′<br>+88 55 | | h m<br>19 47 | ° ′<br>+88 55 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 1.1 | 53.45 | 58.3 | 1.0 | 47.44 | 48.4 | 1.9 | 1.83 | 40.0 | 1.8 | 30.97 | 35.4 |
| 2.1 | 52.98 | 57.9 | 2.0 | 47.69 | 48.1 | 2.9 | 2.53 | 39.8 | 2.8 | 31.92 | 35.3 |
| 3.1 | 52.57 | 57.6 | 3.0 | 47.91 | 47.8 | 3.9 | 3.20 | 39.6 | 3.8 | 32.91 | 35.2 |
| 4.0 | 52.18 | 57.3 | 4.0 | 48.09 | 47.5 | 4.9 | 3.86 | 39.4 | 4.8 | 33.96 | 35.1 |
| 5.0 | 51.80 | 57.0 | 5.0 | 48.24 | 47.2 | 5.9 | 4.53 | 39.2 | 5.8 | 35.07 | 35.0 |
| 6.0 | 51.41 | 56.7 | 6.0 | 48.37 | 46.9 | 6.9 | 5.24 | 38.9 | 6.8 | 36.23 | 35.0 |
| 7.0 | 50.97 | 56.5 | 6.9 | 48.51 | 46.6 | 7.9 | 6.02 | 38.7 | 7.8 | 37.44 | 34.9 |
| 8.0 | 50.50 | 56.2 | 7.9 | 48.67 | 46.3 | 8.9 | 6.87 | 38.4 | 8.8 | 38.67 | 34.9 |
| 9.0 | 50.00 | 55.9 | 8.9 | 48.88 | 46.0 | 9.9 | 7.79 | 38.2 | 9.8 | 39.88 | 34.9 |
| 10.0 | 49.49 | 55.6 | 9.9 | 49.19 | 45.6 | 10.9 | 8.78 | 38.0 | 10.8 | 41.06 | 35.0 |
| 11.0 | 49.00 | 55.3 | 10.9 | 49.58 | 45.3 | 11.9 | 9.80 | 37.8 | 11.8 | 42.20 | 35.0 |
| 12.0 | 48.55 | 55.0 | 11.9 | 50.04 | 45.0 | 12.9 | 10.85 | 37.6 | 12.8 | 43.28 | 35.0 |
| 13.0 | 48.17 | 54.6 | 12.9 | 50.56 | 44.7 | 13.9 | 11.87 | 37.5 | 13.8 | 44.30 | 35.1 |
| 14.0 | 47.87 | 54.2 | 13.9 | 51.12 | 44.4 | 14.9 | 12.67 | 37.4 | 14.8 | 45.29 | 35.1 |
| 15.0 | 47.65 | 53.9 | 14.9 | 51.69 | 44.1 | 15.9 | 13.82 | 37.2 | 15.8 | 46.27 | 35.1 |
| 16.0 | 47.51 | 53.5 | 15.9 | 52.25 | 43.9 | 16.9 | 14.74 | 37.1 | 16.8 | 47.27 | 35.1 |
| 17.0 | 47.42 | 53.2 | 16.9 | 52.80 | 43.6 | 17.8 | 15.63 | 37.0 | 17.8 | 48.30 | 35.1 |
| 18.0 | 47.36 | 52.9 | 17.9 | 53.32 | 43.3 | 18.8 | 16.50 | 36.8 | 18.8 | 49.39 | 35.1 |
| 19.0 | 47.32 | 52.6 | 18.9 | 53.79 | 43.1 | 19.8 | 17.38 | 36.7 | 19.8 | 50.53 | 35.1 |
| 20.0 | 47.26 | 52.3 | 19.9 | 54.24 | 42.8 | 20.8 | 18.30 | 36.5 | 20.8 | 51.71 | 35.2 |
| 21.0 | 47.17 | 52.0 | 20.9 | 54.71 | 42.5 | 21.8 | 19.28 | 36.3 | 21.7 | 52.90 | 35.2 |
| 22.0 | 47.04 | 51.7 | 21.9 | 55.20 | 42.2 | 22.8 | 20.32 | 36.1 | 22.7 | 54.08 | 35.3 |
| 23.0 | 46.89 | 51.4 | 22.9 | 55.76 | 41.9 | 23.8 | 21.42 | 36.0 | 23.7 | 55.23 | 35.4 |
| 24.0 | 46.75 | 51.1 | 23.9 | 56.38 | 41.6 | 24.8 | 22.57 | 35.9 | 24.7 | 56.33 | 35.5 |
| 25.0 | 46.63 | 50.7 | 24.9 | 57.08 | 41.3 | 25.8 | 23.74 | 35.8 | 25.7 | 57.37 | 35.6 |
| 26.0 | 46.54 | 50.3 | 25.9 | 57.84 | 41.1 | 26.8 | 24.89 | 35.7 | 26.7 | 58.34 | 35.7 |
| 27.0 | 46.51 | 50.0 | 26.9 | 58.64 | 40.8 | 27.8 | 26.02 | 35.6 | 27.7 | 59.25 | 35.9 |
| 28.0 | 46.57 | 49.7 | 27.9 | 59.46 | 40.6 | 28.8 | 27.11 | 35.6 | 28.7 | 60.13 | 36.0 |
| 29.0 | 46.71 | 49.3 | 28.9 | 60.28 | 40.4 | 29.8 | 28.13 | 35.5 | 29.7 | 61.02 | 36.1 |
| 30.0 | 46.92 | 49.0 | 29.9 | 61.08 | 40.2 | 30.8 | 29.10 | 35.5 | 30.7 | 61.93 | 36.2 |
| 31.0 | 47.17 | 48.7 | 30.9 | 61.83 | 40.0 | 31.8 | 30.04 | 35.4 | 31.7 | 62.88 | 36.2 |
| 32.0 | 47.44 | 48.4 | 31.9 | 62.53 | 39.8 | 32.8 | 30.97 | 35.4 | 32.7 | 63.88 | 36.3 |

## APPARENT PLACES OF λ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | MAY. | | Mean Solar Date. | JUNE. | | Mean Solar Date. | JULY. | | Mean Solar Date. | AUGUST. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* |
| | h m<br>19 48 | ° ′<br>+88 55 | | h m<br>19 48 | ° ′<br>+88 55 | | h m<br>19 48 | ° ′<br>+88 55 | | h m<br>19 48 | ° ′<br>+88 56 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 1.7 | 2.88 | 36.2 | 1.6 | 28.83 | 42.2 | 1.6 | 39.44 | 51.4 | 1.5 | 32.01 | 1.9 |
| 2.7 | 3.88 | 36.3 | 2.6 | 29.56 | 42.5 | 2.6 | 39.54 | 51.8 | 2.5 | 31.36 | 2.3 |
| 3.7 | 4.93 | 36.4 | 3.6 | 30.26 | 42.8 | 3.5 | 39.56 | 52.2 | 3.5 | 30.70 | 2.6 |
| 4.7 | 6.01 | 36.5 | 4.6 | 30.90 | 43.1 | 4.5 | 39.50 | 52.5 | 4.5 | 30.06 | 2.9 |
| 5.7 | 7.10 | 36.7 | 5.6 | 31.48 | 43.4 | 5.5 | 39.39 | 52.8 | 5.5 | 29.44 | 3.2 |
| 6.7 | 8.19 | 36.8 | 6.6 | 31.99 | 43.7 | 6.5 | 39.26 | 53.2 | 6.5 | 28.85 | 3.4 |
| 7.7 | 9.25 | 37.0 | 7.6 | 32.43 | 44.0 | 7.5 | 39.13 | 53.5 | 7.5 | 28.29 | 3.7 |
| 8.7 | 10.26 | 37.2 | 8.6 | 32.83 | 44.3 | 8.5 | 39.02 | 53.8 | 8.5 | 27.76 | 4.0 |
| 9.7 | 11.20 | 37.4 | 9.6 | 33.20 | 44.6 | 9.5 | 38.93 | 54.1 | 9.5 | 27.23 | 4.4 |
| 10.7 | 12.07 | 37.6 | 10.6 | 33.58 | 44.9 | 10.5 | 38.86 | 54.4 | 10.4 | 26.66 | 4.7 |
| 11.7 | 12.89 | 37.8 | 11.6 | 33.99 | 45.1 | 11.5 | 38.82 | 54.7 | 11.4 | 26.04 | 5.0 |
| 12.7 | 13.69 | 37.9 | 12.6 | 34.44 | 45.4 | 12.5 | 38.81 | 55.0 | 12.4 | 25.36 | 5.4 |
| 13.7 | 14.48 | 38.1 | 13.6 | 34.91 | 45.6 | 13.5 | 38.78 | 55.4 | 13.4 | 24.60 | 5.7 |
| 14.7 | 15.29 | 38.2 | 14.6 | 35.41 | 45.9 | 14.5 | 38.69 | 55.7 | 14.4 | 23.76 | 6.1 |
| 15.7 | 16.13 | 38.4 | 15.6 | 35.91 | 46.2 | 15.5 | 38.54 | 56.1 | 15.4 | 22.87 | 6.4 |
| 16.7 | 17.01 | 38.6 | 16.6 | 36.38 | 46.5 | 16.5 | 38.32 | 56.5 | 16.4 | 21.94 | 6.7 |
| 17.7 | 17.94 | 38.7 | 17.6 | 36.80 | 46.9 | 17.5 | 38.02 | 56.9 | 17.4 | 21.01 | 7.0 |
| 18.7 | 18.89 | 38.9 | 18.6 | 37.16 | 47.2 | 18.5 | 37.65 | 57.2 | 18.4 | 20.11 | 7.3 |
| 19.7 | 19.83 | 39.1 | 19.6 | 37.44 | 47.6 | 19.5 | 37.23 | 57.6 | 19.4 | 19.26 | 7.5 |
| 20.7 | 20.74 | 39.3 | 20.6 | 37.63 | 47.9 | 20.5 | 36.79 | 57.9 | 20.4 | 18.45 | 7.8 |
| 21.7 | 21.60 | 39.6 | 21.6 | 37.76 | 48.3 | 21.5 | 36.35 | 58.2 | 21.4 | 17.67 | 8.0 |
| 22.7 | 22.38 | 39.9 | 22.6 | 37.86 | 48.6 | 22.5 | 35.94 | 58.5 | 22.4 | 16.91 | 8.3 |
| 23.7 | 23.08 | 40.1 | 23.6 | 37.95 | 48.9 | 23.5 | 35.57 | 58.8 | 23.4 | 16.15 | 8.6 |
| 24.7 | 23.71 | 40.4 | 24.6 | 38.06 | 49.2 | 24.5 | 35.26 | 59.1 | 24.4 | 15.37 | 8.9 |
| 25.7 | 24.30 | 40.6 | 25.6 | 38.20 | 49.5 | 25.5 | 34.97 | 59.5 | 25.4 | 14.53 | 9.2 |
| 26.7 | 24.87 | 40.9 | 26.6 | 38.38 | 49.8 | 26.5 | 34.68 | 59.8 | 26.4 | 13.63 | 9.5 |
| 27.7 | 25.44 | 41.1 | 27.6 | 38.60 | 50.1 | 27.5 | 34.38 | 60.1 | 27.4 | 12.67 | 9.8 |
| 28.7 | 26.03 | 41.3 | 28.6 | 38.84 | 50.4 | 28.5 | 34.04 | 60.5 | 28.4 | 11.64 | 10.1 |
| 29.6 | 26.68 | 41.5 | 29.6 | 39.07 | 50.7 | 29.5 | 33.64 | 60.9 | 29.4 | 10.56 | 10.4 |
| 30.6 | 27.38 | 41.7 | 30.6 | 39.28 | 51.0 | 30.5 | 33.16 | 61.2 | 30.4 | 9.46 | 10.7 |
| 31.6 | 28.10 | 42.0 | 31.6 | 39.44 | 51.4 | 31.5 | 32.62 | 61.6 | 31.4 | 8.37 | 10.9 |
| 32.6 | 28.83 | 42.2 | 32.6 | 39.54 | 51.8 | 32.5 | 32.01 | 61.9 | 32.4 | 7.31 | 11.1 |

## APPARENT PLACES OF λ URSÆ MINORIS, FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | SEPTEMBER. | | Mean Solar Date. | OCTOBER. | | Mean Solar Date. | NOVEMBER. | | Mean Solar Date. | DECEMBER. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* | | Right Ascension. | Declination *North.* |
| | h m | ° ′ | | h m | ° ′ | | h m | ° ′ | | h m | ° ′ |
| | 19 47 | +88 56 | | 19 46 | +88 56 | | 19 46 | +88 56 | | 19 45 | +88 56 |
| | s | ″ | | s | ″ | | s | ″ | | s | ″ |
| 1.4 | 67.31 | 11.1 | 1.3 | 91.80 | 17.1 | 1.2 | 49.85 | 18.9 | 1.1 | 72.02 | 16.0 |
| 2.4 | 66.29 | 11.3 | 2.3 | 90.60 | 17.2 | 2.2 | 48.53 | 18.9 | 2.1 | 70.81 | 15.8 |
| 3.4 | 65.30 | 11.6 | 3.3 | 89.40 | 17.3 | 3.2 | 47.15 | 18.9 | 3.1 | 69.58 | 15.6 |
| 4.4 | 64.35 | 11.8 | 4.3 | 88.18 | 17.5 | 4.2 | 45.71 | 18.9 | 4.1 | 68.37 | 15.4 |
| 5.4 | 63.41 | 12.0 | 5.3 | 86.92 | 17.6 | 5.2 | 44.23 | 18.9 | 5.1 | 67.20 | 15.2 |
| 6.4 | 62.45 | 12.3 | 6.3 | 85.59 | 17.8 | 6.2 | 42.73 | 18.9 | 6.1 | 66.07 | 15.0 |
| 7.4 | 61.46 | 12.5 | 7.3 | 84.20 | 17.9 | 7.2 | 41.25 | 18.8 | 7.1 | 65.03 | 14.7 |
| 8.4 | 60.41 | 12.8 | 8.3 | 82.74 | 18.1 | 8.2 | 39.81 | 18.7 | 8.1 | 64.08 | 14.5 |
| 9.4 | 59.29 | 13.1 | 9.3 | 81.24 | 18.2 | 9.2 | 38.43 | 18.6 | 9.1 | 63.17 | 14.3 |
| 10.4 | 58.08 | 13.4 | 10.3 | 79.73 | 18.3 | 10.2 | 37.12 | 18.5 | 10.1 | 62.31 | 14.0 |
| 11.4 | 56.81 | 13.6 | 11.3 | 78.23 | 18.3 | 11.2 | 35.88 | 18.4 | 11.1 | 61.48 | 13.8 |
| 12.4 | 55.51 | 13.8 | 12.3 | 76.78 | 18.4 | 12.2 | 34.68 | 18.3 | 12.1 | 60.65 | 13.6 |
| 13.4 | 54.21 | 14.0 | 13.3 | 75.39 | 18.4 | 13.2 | 33.51 | 18.2 | 13.1 | 59.79 | 13.4 |
| 14.3 | 52.93 | 14.2 | 14.3 | 74.06 | 18.5 | 14.2 | 32.34 | 18.1 | 14.1 | 58.89 | 13.2 |
| 15.3 | 51.69 | 14.4 | 15.3 | 72.77 | 18.5 | 15.2 | 31.14 | 18.1 | 15.1 | 57.95 | 13.0 |
| 16.3 | 50.51 | 14.6 | 16.3 | 71.50 | 18.6 | 16.2 | 29.89 | 18.1 | 16.1 | 56.99 | 12.8 |
| 17.3 | 49.37 | 14.7 | 17.3 | 70.25 | 18.6 | 17.2 | 28.61 | 18.0 | 17.1 | 56.03 | 12.6 |
| 18.3 | 48.25 | 14.9 | 18.3 | 68.98 | 18.7 | 18.2 | 27.29 | 17.9 | 18.1 | 55.09 | 12.3 |
| 19.3 | 47.15 | 15.1 | 19.3 | 67.67 | 18.8 | 19.2 | 25.95 | 17.8 | 19.1 | 54.20 | 12.0 |
| 20.3 | 46.05 | 15.3 | 20.3 | 66.30 | 18.9 | 20.2 | 24.60 | 17.7 | 20.1 | 53.38 | 11.7 |
| 21.3 | 44.91 | 15.5 | 21.2 | 64.88 | 19.0 | 21.2 | 23.27 | 17.5 | 21.1 | 52.63 | 11.4 |
| 22.3 | 43.71 | 15.7 | 22.2 | 63.42 | 19.0 | 22.2 | 21.99 | 17.3 | 22.1 | 51.95 | 11.1 |
| 23.3 | 42.46 | 15.9 | 23.2 | 61.93 | 19.1 | 23.2 | 20.78 | 17.2 | 23.1 | 51.33 | 10.8 |
| 24.3 | 41.15 | 16.1 | 24.2 | 60.44 | 19.1 | 24.2 | 19.64 | 17.0 | 24.1 | 50.74 | 10.6 |
| 25.3 | 39.78 | 16.3 | 25.2 | 58.98 | 19.0 | 25.2 | 18.55 | 16.8 | 25.1 | 50.16 | 10.3 |
| 26.3 | 38.38 | 16.5 | 26.2 | 57.56 | 19.0 | 26.2 | 17.49 | 16.7 | 26.1 | 49.56 | 10.0 |
| 27.3 | 36.99 | 16.6 | 27.2 | 56.20 | 19.0 | 27.2 | 16.44 | 16.5 | 27.1 | 48.93 | 9.8 |
| 28.3 | 35.63 | 16.7 | 28.2 | 54.89 | 19.0 | 28.1 | 15.39 | 16.4 | 28.1 | 48.26 | 9.5 |
| 29.3 | 34.31 | 16.8 | 29.2 | 53.62 | 18.9 | 29.1 | 14.31 | 16.2 | 29.1 | 47.56 | 9.3 |
| 30.3 | 33.03 | 16.9 | 30.2 | 52.37 | 18.9 | 30.1 | 13.19 | 16.1 | 30.1 | 46.84 | 9.0 |
| 31.3 | 31.80 | 17.1 | 31.2 | 51.12 | 18.9 | 31.1 | 12.02 | 16.0 | 31.1 | 46.12 | 9.7 |
| 32.3 | 30.60 | 17.2 | 32.2 | 49.85 | 18.9 | 32.1 | 10.81 | 15.8 | 32.1 | 45.43 | 9.4 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Andromedæ. | | | | γ Pegasi. (*Algenib.*) | | | | *β Hydri. | | | | α Cassiopeæ. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | | Declination *North.* | | Right Ascension. | | Declination *North.* | | Right Ascension. | | Declination *South.* | | Right Ascension. | | Declination *North.* | |
| | h m<br>0 1 | | +28° 24′ | | h m<br>0 6 | | +14° 29′ | | h m<br>0 19 | | −77° 56′ | | h m<br>0 33 | | +55° 51′ | |
| | s | | ″ | | s | | ″ | | s | | ″ | | s | | ″ | |
| Jan. 0.3 | 58.25 | −.13 | 29.8 | −0.8 | 50.75 | −.11 | 43.3 | −0.7 | 14.29 | −.91 | 92.7 | +0.8 | 27.97 | −.27 | 42.0 | −0.1 |
| 10.2 | 58.12 | .13 | 28.9 | 1.0 | 50.65 | .10 | 42.6 | 0.8 | 13.40 | .87 | 91.5 | 1.5 | 27.70 | .28 | 41.6 | 0.6 |
| 20.2 | 58.00 | .12 | 27.8 | 1.2 | 50.55 | .10 | 41.7 | 0.9 | 12.56 | .80 | 89.8 | 2.0 | 27.42 | .27 | 40.7 | 1.1 |
| 30.2 | 57.89 | .10 | 26.5 | 1.4 | 50.46 | .08 | 40.7 | 1.0 | 11.81 | .70 | 87.5 | 2.5 | 27.16 | .25 | 39.4 | 1.6 |
| Feb. 9.1 | 57.80 | .08 | 25.0 | 1.5 | 50.38 | .06 | 39.7 | 1.0 | 11.16 | .59 | 84.8 | 3.0 | 26.93 | .22 | 37.6 | 1.9 |
| 19.1 | 57.73 | .05 | 23.4 | 1.6 | 50.33 | .04 | 38.8 | 0.9 | 10.63 | .46 | 81.6 | 3.3 | 26.74 | .17 | 35.5 | 2.2 |
| 29.1 | 57.70 | −.02 | 21.8 | 1.5 | 50.31 | −.01 | 37.9 | 0.8 | 10.24 | .32 | 78.2 | 3.6 | 26.59 | .12 | 33.2 | 2.4 |
| Mar. 10.0 | 57.71 | +.02 | 20.4 | 1.4 | 50.31 | +.02 | 37.2 | 0.7 | 10.00 | .17 | 74.5 | 3.8 | 26.50 | −.06 | 30.8 | 2.5 |
| 20.0 | 57.75 | .07 | 19.0 | 1.2 | 50.35 | .06 | 36.6 | 0.4 | 9.91 | −.01 | 70.7 | 3.9 | 26.48 | +.02 | 28.3 | 2.5 |
| 30.0 | 57.84 | .11 | 17.9 | 1.0 | 50.43 | .10 | 36.3 | −0.2 | 9.98 | +.15 | 66.8 | 3.9 | 26.54 | .09 | 25.9 | 2.3 |
| Apr. 9.0 | 57.97 | .16 | 17.1 | 0.7 | 50.56 | .14 | 36.3 | +0.1 | 10.20 | .30 | 62.9 | 3.9 | 26.66 | .17 | 23.7 | 2.1 |
| 19.0 | 58.15 | .21 | 16.6 | −0.3 | 50.72 | .19 | 36.5 | 0.4 | 10.59 | .46 | 59.1 | 3.7 | 26.86 | .24 | 21.7 | 1.8 |
| 28.9 | 58.38 | .25 | 16.4 | +0.1 | 50.93 | .23 | 37.1 | 0.7 | 11.12 | .61 | 55.5 | 3.5 | 27.14 | .31 | 20.1 | 1.4 |
| May 8.9 | 58.65 | .28 | 16.7 | 0.5 | 51.17 | .26 | 38.0 | 1.1 | 11.79 | .74 | 52.1 | 3.2 | 27.47 | .36 | 19.0 | 1.0 |
| 18.9 | 58.94 | .31 | 17.3 | 0.8 | 51.45 | .29 | 39.2 | 1.4 | 12.60 | .86 | 49.1 | 2.9 | 27.86 | .42 | 18.2 | −0.5 |
| 28.8 | 59.27 | .34 | 18.4 | 1.2 | 51.75 | .31 | 40.7 | 1.6 | 13.51 | .96 | 46.4 | 2.5 | 28.30 | .46 | 18.0 | 0.0 |
| June 7.8 | 59.62 | .35 | 19.8 | 1.6 | 52.06 | .33 | 42.4 | 1.8 | 14.51 | 1.04 | 44.2 | 2.0 | 28.77 | .48 | 18.3 | +0.5 |
| 17.8 | 59.97 | .35 | 21.5 | 1.9 | 52.39 | .33 | 44.3 | 2.0 | 15.58 | 1.10 | 42.5 | 1.4 | 29.26 | .49 | 19.1 | 1.0 |
| 27.7 | 60.32 | .35 | 23.5 | 2.1 | 52.73 | .33 | 46.4 | 2.1 | 16.69 | 1.12 | 41.3 | 0.9 | 29.75 | .49 | 20.3 | 1.5 |
| July 7.7 | 60.66 | .34 | 25.7 | 2.3 | 53.05 | .32 | 48.6 | 2.2 | 17.81 | 1.12 | 40.7 | +0.3 | 30.24 | .48 | 22.0 | 1.9 |
| 17.7 | 60.99 | .32 | 28.1 | 2.5 | 53.36 | .30 | 50.8 | 2.2 | 18.92 | 1.08 | 40.6 | −0.2 | 30.71 | .46 | 24.1 | 2.3 |
| 27.7 | 61.30 | .29 | 30.6 | 2.6 | 53.65 | .28 | 53.0 | 2.2 | 19.97 | 1.02 | 41.2 | 0.8 | 31.16 | .43 | 26.6 | 2.6 |
| Aug. 6.6 | 61.57 | .25 | 33.2 | 2.6 | 53.91 | .25 | 55.2 | 2.1 | 20.94 | .92 | 42.3 | 1.4 | 31.57 | .39 | 29.3 | 2.9 |
| 16.6 | 61.80 | .22 | 35.8 | 2.6 | 54.14 | .21 | 57.3 | 2.0 | 21.79 | .79 | 43.9 | 1.9 | 31.93 | .34 | 32.3 | 3.1 |
| 26.6 | 62.00 | .18 | 38.3 | 2.5 | 54.34 | .18 | 59.2 | 1.8 | 22.51 | .64 | 45.9 | 2.3 | 32.24 | .28 | 35.4 | 3.2 |
| Sept. 5.6 | 62.16 | .14 | 40.7 | 2.4 | 54.49 | .14 | 60.9 | 1.7 | 23.06 | .47 | 48.4 | 2.6 | 32.50 | .23 | 38.7 | 3.3 |
| 15.5 | 62.28 | .10 | 43.0 | 2.2 | 54.61 | .10 | 62.5 | 1.5 | 23.44 | .29 | 51.1 | 2.9 | 32.70 | .17 | 42.0 | 3.3 |
| 25.5 | 62.35 | .06 | 45.1 | 2.0 | 54.69 | .06 | 63.8 | 1.2 | 23.64 | +.09 | 54.1 | 3.0 | 32.84 | .12 | 45.3 | 3.3 |
| Oct. 5.5 | 62.39 | +.02 | 47.0 | 1.8 | 54.73 | +.03 | 64.9 | 1.0 | 23.63 | −.10 | 57.1 | 3.0 | 32.93 | +.06 | 48.5 | 3.2 |
| 15.4 | 62.39 | −.01 | 48.7 | 1.6 | 54.75 | .00 | 65.8 | 0.8 | 23.44 | .29 | 60.0 | 2.9 | 32.96 | .00 | 51.6 | 3.0 |
| 25.4 | 62.37 | .04 | 50.2 | 1.3 | 54.73 | −.03 | 66.5 | 0.6 | 23.07 | .46 | 62.9 | 2.7 | 32.94 | −.05 | 54.4 | 2.7 |
| Nov. 4.4 | 62.31 | .07 | 51.3 | 1.0 | 54.69 | .05 | 66.9 | 0.3 | 22.53 | .61 | 65.4 | 2.3 | 32.86 | .10 | 57.0 | 2.4 |
| 14.4 | 62.23 | .09 | 52.1 | 0.7 | 54.63 | .07 | 67.2 | +0.1 | 21.85 | .74 | 67.5 | 1.9 | 32.75 | .14 | 59.2 | 2.1 |
| 24.3 | 62.13 | .11 | 52.7 | 0.4 | 54.55 | .09 | 67.2 | −0.1 | 21.06 | .84 | 69.1 | 1.4 | 32.58 | .18 | 61.1 | 1.7 |
| Dec. 4.3 | 62.02 | .12 | 52.9 | +0.1 | 54.46 | .10 | 67.0 | 0.3 | 20.18 | .91 | 70.2 | 0.8 | 32.39 | .22 | 62.5 | 1.2 |
| 14.3 | 61.90 | .13 | 52.8 | −0.3 | 54.36 | .10 | 66.6 | 0.5 | 19.26 | .94 | 70.7 | −0.2 | 32.16 | .24 | 63.5 | 0.7 |
| 24.3 | 61.77 | .13 | 52.4 | 0.6 | 54.25 | .11 | 66.0 | 0.6 | 18.31 | .94 | 70.6 | +0.4 | 31.91 | .26 | 63.9 | +0.2 |
| 34.2 | 61.64 | −.13 | 51.7 | −0.9 | 54.15 | −.11 | 65.3 | −0.8 | 17.38 | −.92 | 69.8 | +1.1 | 31.64 | −.27 | 63.9 | −0.3 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | β Ceti. | | *21 Cassiopeæ. | | ε Piscium. | | $\theta^1$ Ceti. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 0 37 | −18 39 | 0 37 | +74 18 | 0 56 | +7 13 | 1 17 | −8 48 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.3 | 21.98 −.11 | 69.4 −0.5 | 27.33 −.69 | 53.9 +0.3 | 30.55 −.10 | 23.0 −0.6 | 49.83 −.10 | 86.1 −0.7 |
| 10.2 | 21.87 .12 | 69.8 −0.3 | 26.63 .70 | 53.9 −0.3 | 30.44 .11 | 22.4 0.6 | 49.72 .11 | 86.7 0.6 |
| 20.2 | 21.76 .11 | 70.0 0.0 | 25.95 .68 | 53.3 0.9 | 30.33 .11 | 21.7 0.7 | 49.61 .12 | 87.2 0.4 |
| 30.2 | 21.65 .10 | 69.9 +0.2 | 25.29 .63 | 52.2 1.5 | 30.23 .10 | 21.1 0.6 | 49.49 .12 | 87.5 −0.2 |
| Feb. 9.1 | 21.56 .09 | 69.5 0.5 | 24.70 .56 | 50.4 2.0 | 30.13 .09 | 20.5 0.6 | 49.38 .11 | 87.6 0.0 |
| 19.1 | 21.48 .07 | 68.9 0.8 | 24.19 .46 | 48.3 2.4 | 30.04 .08 | 20.0 0.5 | 49.28 .09 | 87.5 +0.2 |
| 29.1 | 21.43 .04 | 68.0 1.1 | 23.79 .34 | 45.8 2.7 | 29.98 .05 | 19.6 0.4 | 49.20 .07 | 87.2 0.5 |
| Mar. 10.0 | 21.40 −.01 | 66.8 1.3 | 23.52 .20 | 43.0 2.9 | 29.94 −.02 | 19.3 −0.2 | 49.14 .05 | 86.6 0.7 |
| 20.0 | 21.41 +.03 | 65.3 1.6 | 23.39 −.05 | 40.1 2.9 | 29.93 +.01 | 19.2 0.0 | 49.11 −.01 | 85.8 0.9 |
| 30.0 | 21.46 .07 | 63.7 1.8 | 23.42 +.10 | 37.2 2.9 | 29.96 .05 | 19.3 +0.2 | 49.11 +.03 | 84.7 1.2 |
| Apr. 9.0 | 21.55 .11 | 61.8 2.0 | 23.60 .26 | 34.4 2.7 | 30.03 .09 | 19.7 0.5 | 49.16 .07 | 83.4 1.4 |
| 19.0 | 21.68 .15 | 59.7 2.2 | 23.93 .40 | 31.8 2.4 | 30.15 .14 | 20.3 0.7 | 49.25 .11 | 81.9 1.6 |
| 28.9 | 21.85 .19 | 57.4 2.3 | 24.40 .54 | 29.5 2.1 | 30.30 .18 | 21.1 1.0 | 49.38 .15 | 80.2 1.8 |
| May 8.9 | 22.06 .23 | 55.1 2.4 | 25.00 .66 | 27.7 1.6 | 30.50 .22 | 22.2 1.2 | 49.55 .19 | 78.3 2.0 |
| 18.9 | 22.31 .27 | 52.6 2.5 | 25.70 .75 | 26.3 1.1 | 30.74 .25 | 23.6 1.5 | 49.76 .23 | 76.2 2.1 |
| 28.8 | 22.59 .29 | 50.2 2.4 | 26.49 .83 | 25.4 0.6 | 31.01 .28 | 25.2 1.7 | 50.01 .26 | 74.1 2.2 |
| June 7.8 | 22.89 .32 | 47.8 2.4 | 27.35 .88 | 25.1 −0.1 | 31.30 .31 | 27.0 1.9 | 50.29 .29 | 71.8 2.3 |
| 17.8 | 23.21 .33 | 45.5 2.2 | 28.24 .90 | 25.3 +0.5 | 31.62 .32 | 28.9 2.0 | 50.59 .31 | 69.6 2.2 |
| 27.7 | 23.55 .33 | 43.3 2.1 | 29.15 .91 | 26.0 1.0 | 31.94 .33 | 30.9 2.0 | 50.91 .32 | 67.4 2.2 |
| July 7.7 | 23.88 .33 | 41.4 1.8 | 30.04 .89 | 27.3 1.6 | 32.26 .32 | 32.9 2.1 | 51.23 .32 | 65.3 2.0 |
| 17.7 | 24.21 .32 | 39.7 1.5 | 30.91 .84 | 29.1 2.0 | 32.58 .32 | 35.0 2.0 | 51.55 .32 | 63.4 1.8 |
| 27.7 | 24.52 .30 | 38.3 1.2 | 31.73 .78 | 31.4 2.5 | 32.89 .30 | 36.9 1.9 | 51.86 .31 | 61.6 1.6 |
| Aug. 6.7 | 24.81 .28 | 37.2 0.9 | 32.47 .71 | 34.0 2.8 | 33.18 .28 | 38.8 1.8 | 52.16 .29 | 60.2 1.3 |
| 16.6 | 25.07 .24 | 36.5 0.5 | 33.14 .62 | 37.0 3.1 | 33.44 .25 | 40.5 1.6 | 52.43 .26 | 59.0 1.0 |
| 26.6 | 25.29 .21 | 36.2 +0.2 | 33.71 .52 | 40.3 3.4 | 33.67 .22 | 42.1 1.4 | 52.68 .23 | 58.1 0.7 |
| Sept. 5.6 | 25.48 .17 | 36.2 −0.2 | 34.18 .42 | 43.8 3.6 | 33.87 .18 | 43.4 1.2 | 52.90 .20 | 57.6 0.4 |
| 15.5 | 25.63 .13 | 36.5 0.5 | 34.54 .30 | 47.4 3.7 | 34.04 .15 | 44.5 1.0 | 53.08 .16 | 57.3 +0.1 |
| 25.5 | 25.74 .09 | 37.2 0.8 | 34.78 .19 | 51.1 3.7 | 34.17 .11 | 45.4 0.8 | 53.23 .13 | 57.4 −0.2 |
| Oct. 5.5 | 25.81 .05 | 38.0 1.0 | 34.91 +.07 | 54.9 3.7 | 34.26 .08 | 46.0 0.5 | 53.34 .10 | 57.7 0.5 |
| 15.5 | 25.85 +.02 | 39.1 1.2 | 34.92 −.05 | 58.5 3.6 | 34.33 .05 | 46.4 0.3 | 53.42 .06 | 58.3 0.7 |
| 25.4 | 25.85 −.01 | 40.3 1.3 | 34.82 .17 | 62.0 3.4 | 34.36 +.02 | 46.7 +0.1 | 53.47 +.03 | 59.1 0.9 |
| Nov. 4.4 | 25.83 .04 | 41.6 1.3 | 34.60 .28 | 65.3 3.1 | 34.36 −.01 | 46.7 0.0 | 53.49 .00 | 60.0 1.0 |
| 14.4 | 25.77 .06 | 42.9 1.3 | 34.27 .38 | 68.3 2.8 | 34.34 .03 | 46.6 −0.2 | 53.48 −.02 | 61.0 1.0 |
| 24.3 | 25.70 .08 | 44.2 1.2 | 33.84 .47 | 70.8 2.3 | 34.30 .05 | 46.3 0.3 | 53.44 .04 | 62.0 1.0 |
| Dec. 4.3 | 25.61 .10 | 45.3 1.1 | 33.33 .55 | 72.9 1.8 | 34.24 .07 | 45.9 0.4 | 53.39 .07 | 63.0 1.0 |
| 14.3 | 25.51 .11 | 46.3 0.9 | 32.74 .62 | 74.5 1.3 | 34.16 .09 | 45.5 0.5 | 53.31 .08 | 64.0 0.9 |
| 24.3 | 25.40 .11 | 47.1 0.7 | 32.09 .67 | 75.5 0.7 | 34.07 .10 | 44.9 0.6 | 53.22 .10 | 64.9 0.8 |
| 34.2 | 25.28 −.12 | 47.6 −0.4 | 31.42 −.69 | 75.9 +0.1 | 33.97 −.10 | 44.3 −0.6 | 53.12 −.11 | 65.6 −0.7 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *38 Cassiopeæ. |  | η Piscium. |  | α Eridani. (*Achernar.*) |  | ο Piscium. |  |
|---|---|---|---|---|---|---|---|---|
|  | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* |
|  | h m<br>1 21 | ° ′<br>+69 37 | h m<br>1 24 | ° ′<br>+14 42 | h m<br>1 33 | ° ′<br>−57 51 | h m<br>1 38 | ° ′<br>+8 31 |
|  | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.3 | 61.05 −.47 | 52.6 +0.8 | 51.04 −.10 | 29.1 −0.4 | 6.87 −.31 | 75.3 −0.6 | 51.14 −.11 | 63.6 −0.5 |
| 10.2 | 60.56 .50 | 53 2 +0.2 | 50.93 .11 | 28.6 0.6 | 6.55 .32 | 75.7 −0.1 | 51.04 .11 | 63.0 0.6 |
| 20.2 | 60.05 .51 | 53.1 −0.4 | 50.82 .12 | 28.0 0.7 | 6.22 .33 | 75.4 +0.5 | 50.92 .12 | 62.4 0.6 |
| 30.2 | 59.54 .50 | 52.4 0.9 | 50.70 .12 | 27.3 0.7 | 5.90 .32 | 74.6 1.1 | 50.81 .12 | 61.9 0.6 |
| Feb. 9.2 | 59.05 .47 | 51.2 1.5 | 50.58 .12 | 26.6 0.7 | 5.60 .30 | 73.3 1.6 | 50.69 .12 | 61.3 0.5 |
| 19.1 | 58.61 .41 | 49.5 1.9 | 50.47 .10 | 25.9 0.7 | 5.32 .27 | 71.5 2.1 | 50.57 .11 | 60.8 0.5 |
| 29.1 | 58.23 .34 | 47.4 2.3 | 50.38 .08 | 25.2 0.7 | 5.07 .23 | 69.2 2.5 | 50.48 .09 | 60.4 0.4 |
| Mar. 10.0 | 57.94 .24 | 45.0 2.5 | 50.31 .05 | 24.5 0.6 | 4.86 .18 | 66.5 2.9 | 50.40 .06 | 60.1 0.2 |
| 20.1 | 57.75 .14 | 42.4 2.7 | 50.28 −.02 | 24.1 0.4 | 4.71 .12 | 63.5 3.2 | 50.36 −.03 | 59.9 −0.1 |
| 30.1 | 57.67 −.02 | 39.7 2.7 | 50.28 +.03 | 23.7 −0.2 | 4.62 −.06 | 60.2 3.4 | 50.35 +.01 | 60.0 +0.1 |
| Apr. 9.0 | 57.71 +.10 | 36.9 2.7 | 50.33 .07 | 23.6 0.0 | 4.59 +.01 | 56.7 3.6 | 50.38 .05 | 60.2 0.3 |
| 19.0 | 57.88 .22 | 34.3 2.5 | 50.42 .11 | 23.7 +0.2 | 4.63 .08 | 53.1 3.7 | 50.45 .10 | 60.6 0.6 |
| 29.0 | 58.16 .34 | 32.0 2.2 | 50.55 .16 | 24.1 0.5 | 4.75 .15 | 49.4 3.7 | 50.57 .14 | 61.3 0.8 |
| May 8.9 | 58.55 .45 | 29.9 1.9 | 50.73 .20 | 24.7 0.8 | 4.93 .21 | 45.8 3.6 | 50.73 .18 | 62.3 1.1 |
| 18.9 | 59.05 .54 | 28.2 1.5 | 50.95 .24 | 25.6 1.0 | 5.17 .28 | 42.3 3.5 | 50.94 .23 | 63.5 1.3 |
| 28.9 | 59.63 .62 | 27.0 1.0 | 51.21 .27 | 26.8 1.3 | 5.49 .34 | 38.9 3.2 | 51.18 .26 | 64.9 1.5 |
| June 7.8 | 60.28 .68 | 26.3 −0.5 | 51.50 .30 | 28.2 1.5 | 5.85 .40 | 35.8 2.9 | 51.45 .29 | 66.5 1.7 |
| 17.8 | 60.98 .72 | 26.1 0.0 | 51.81 .32 | 29.8 1.7 | 6.27 .43 | 33.1 2.6 | 51.75 .31 | 68.2 1.8 |
| 27.8 | 61.71 .74 | 26.3 +0.5 | 52.13 .33 | 31.5 1.8 | 6.72 .46 | 30.7 2.1 | 52.06 .32 | 70.1 1.9 |
| July 7.8 | 62.45 .75 | 27.1 1.0 | 52.47 .33 | 33.4 1.9 | 7.19 .48 | 28.8 1.7 | 52.39 .33 | 72.0 1.9 |
| 17.7 | 63.19 .73 | 28.4 1.5 | 52.80 .33 | 35.4 2.0 | 7.68 .49 | 27.4 1.1 | 52.71 .32 | 73.9 1.9 |
| 27.7 | 63.91 .70 | 30.2 2.0 | 53.12 .31 | 37.4 2.0 | 8.16 .48 | 26.6 +0.6 | 53.03 .31 | 75.8 1.9 |
| Aug. 6.7 | 64.59 .66 | 32.3 2.4 | 53.42 .30 | 39.3 1.9 | 8.63 .46 | 26.3 0.0 | 53.34 .30 | 77.6 1.8 |
| 16.6 | 65.23 .60 | 34.9 2.7 | 53.71 .27 | 41.2 1.8 | 9.08 .43 | 26.6 −0.6 | 53.62 .28 | 79.3 1.6 |
| 26.6 | 65.80 .54 | 37.7 3.0 | 53.96 .24 | 42.9 1.7 | 9.48 .38 | 27.5 1.1 | 53.88 .25 | 80.8 1.4 |
| Sept. 5.6 | 66.30 .47 | 40.8 3.2 | 54.19 .21 | 44.6 1.5 | 9.83 .32 | 28.9 1.6 | 54.12 .22 | 82.2 1.2 |
| 15.6 | 66.73 .39 | 44.1 3.4 | 54.38 .18 | 46.0 1.4 | 10.12 .26 | 30.7 2.1 | 54.32 .19 | 83.3 1.0 |
| 25.5 | 67.07 .30 | 47.6 3.5 | 54.55 .15 | 47.3 1.2 | 10.35 .20 | 33.0 2.4 | 54.49 .16 | 84.2 0.8 |
| Oct. 5.5 | 67.33 .21 | 51.1 3.5 | 54.67 .11 | 48.3 1.0 | 10.51 .12 | 35.6 2.7 | 54.63 .12 | 84.8 0.6 |
| 15.5 | 67.50 .12 | 54.6 3.5 | 54.77 .08 | 49.2 0.8 | 10.60 +.05 | 38.4 2.9 | 54.74 .09 | 85.3 0.4 |
| 25 5 | 67.57 +.03 | 58.0 3.4 | 54.83 .05 | 49.8 0.6 | 10.62 −.02 | 41.3 2.9 | 54.82 .06 | 85.5 +0.2 |
| Nov. 4.4 | 67.56 −.06 | 61.3 3.2 | 54.87 +.02 | 50.3 0.4 | 10.57 .08 | 44.2 2.8 | 54.86 .03 | 85.6 0.0 |
| 14.4 | 67.45 .15 | 64.3 2.9 | 54.88 −.01 | 50.6 +0.2 | 10.46 .14 | 46.9 2.6 | 54.88 +.01 | 85.5 −0.2 |
| 24.4 | 67.26 .23 | 67.1 2.6 | 54.86 .03 | 50.7 0.0 | 10.29 .20 | 49.4 2.3 | 54.88 −.02 | 85.3 0.3 |
| Dec. 4.3 | 66.99 .31 | 69.4 2.1 | 54.81 .05 | 50.6 −0.1 | 10.07 .24 | 51.5 2.0 | 54.85 .04 | 85.0 0.4 |
| 14.3 | 66.64 .38 | 71.3 1.7 | 54.75 .07 | 50.4 0.3 | 9.81 .28 | 53.3 1.5 | 54.79 .07 | 84.5 0.5 |
| 24.3 | 66.23 .44 | 72.7 1.1 | 54.67 .09 | 50.1 0.4 | 9.52 .30 | 54.5 1.0 | 54.71 .09 | 84.1 0.5 |
| 34.3 | 65.77 −.48 | 73.6 +0.6 | 54.57 −.11 | 49.6 −0.5 | 9.20 −.33 | 55.2 −0.4 | 54.62 −.10 | 83.5 −0.6 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON

| Mean Solar Date. | β Arietis. | | *50 Cassiopeæ. | | α Arietis. | | ξ¹ Ceti. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>1 47 | +20° 12′ | h m<br>1 52 | +71° 49′ | h m<br>2 0 | +22° 52′ | h m<br>2 6 | +8° 15′ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.3 | 47.76 −.11 | 13.9 −0.3 | 52.69 −.50 | 32.2 +1.2 | 11.44 −.10 | 41.4 −0.2 | 26.10 −.09 | 56.5 −0.5 |
| 10.3 | 47.65 .12 | 13.5 0.4 | 52.16 .55 | 33.2 0.7 | 11.33 .12 | 41.2 0.4 | 26.00 .11 | 55.9 0.5 |
| 20.2 | 47.53 .13 | 13.0 0.6 | 51.60 .58 | 33.5 +0.1 | 11.21 .13 | 40.8 0.5 | 25.89 .12 | 55.4 0.5 |
| 30.2 | 47.40 .13 | 12.4 0.7 | 51.01 .59 | 33.3 −0.5 | 11.07 .14 | 40.2 0.7 | 25.77 .13 | 54.9 0.5 |
| Feb. 9.2 | 47.27 .13 | 11.7 0.8 | 50.43 .57 | 32.5 1.1 | 10.93 .14 | 39.5 0.8 | 25.64 .13 | 54.3 0.5 |
| 19.2 | 47.14 .12 | 10.8 0.8 | 49.89 .52 | 31.2 1.6 | 10.80 .13 | 38.7 0.9 | 25.52 .12 | 53.9 0.4 |
| 29.2 | 47.03 .10 | 10.0 0.8 | 49.40 .45 | 29.4 2.0 | 10.68 .11 | 37.8 0.9 | 25.40 .11 | 53.5 0.3 |
| Mar 10.1 | 46.94 .08 | 9.2 0.8 | 49.00 .35 | 27.2 2.3 | 10.57 .09 | 36.9 0.9 | 25.30 .08 | 53.2 0.2 |
| 20.1 | 46.88 −.04 | 8.5 0.7 | 48.70 .24 | 24.8 2.6 | 10.50 .05 | 36.1 0.8 | 25.23 .05 | 53.1 −0.1 |
| 30.1 | 46.86 .00 | 7.8 0.6 | 48.52 −.12 | 22.1 2.7 | 10.47 −.01 | 35.3 0.7 | 25.20 −.02 | 53.1 +0.1 |
| Apr. 9.0 | 46.88 +.05 | 7.4 0.4 | 48.47 +.02 | 19.4 2.7 | 10.48 + 03 | 34.7 0.5 | 25.20 +.02 | 53.4 0.3 |
| 19.0 | 46.95 .09 | 7.1 −0.1 | 48.56 .15 | 16.6 2.6 | 10.54 .10 | 34.3 0.3 | 25.25 .07 | 53.8 0.6 |
| 29.0 | 47.07 .14 | 7.1 +0.1 | 48.78 .29 | 14.1 2.4 | 10.65 .13 | 34.1 −0.1 | 25.34 .12 | 54.5 0.8 |
| May 8.9 | 47.23 .19 | 7.3 0.4 | 49.13 .41 | 11.8 2.2 | 10.80 .18 | 34.1 +0.2 | 25.48 .16 | 55.3 1.0 |
| 18.9 | 47.44 .23 | 7.9 0.7 | 49.60 .53 | 9.8 1.8 | 11.00 .22 | 34.4 0.5 | 25.66 .20 | 56.5 1.2 |
| 28.9 | 47.69 .27 | 8.7 0.9 | 50.18 .63 | 8.2 1.4 | 11.24 .26 | 35.0 0.7 | 25.88 .24 | 57.8 1.4 |
| June 7.9 | 47.97 .30 | 9.7 1.2 | 50.84 .71 | 7.1 0.9 | 11.52 .29 | 35.9 1.0 | 26.13 .27 | 59.3 1.6 |
| 17.8 | 48.28 .32 | 11.0 1.4 | 51.58 .77 | 6.4 −0.4 | 11.83 .32 | 37.0 1.3 | 26.42 .30 | 61.0 1.7 |
| 27.8 | 48.61 .33 | 12.5 1.6 | 52.37 .81 | 6.2 +0.1 | 12.16 .34 | 38.4 1.5 | 26.72 .31 | 62.8 1.8 |
| July 7.8 | 48.94 .34 | 14.2 1.7 | 53.19 .83 | 6.5 0.6 | 12.50 .34 | 39.9 1.6 | 27.04 .32 | 64.6 1.9 |
| 17.8 | 49.28 .34 | 16.0 1.8 | 54.02 .83 | 7.4 1.1 | 12.85 .34 | 41.6 1.8 | 27.36 .32 | 66.4 1.9 |
| 27.7 | 49.62 .33 | 17.9 1.9 | 54.84 .81 | 8.6 1.5 | 13.19 .34 | 43.4 1.8 | 27.68 .32 | 68.3 1.8 |
| Aug. 6.7 | 49.94 .31 | 19.8 1.9 | 55.64 .78 | 10.4 2.0 | 13.51 .32 | 45.2 1.9 | 27.99 .31 | 70.0 1.7 |
| 16.7 | 50.24 .29 | 21.7 1.9 | 56.39 .73 | 12.5 2.3 | 13.83 .30 | 47.1 1.9 | 28.29 .29 | 71.6 1.5 |
| 26.6 | 50.52 .27 | 23.5 1.8 | 57.10 .67 | 15.0 2.7 | 14.12 .28 | 48.9 1.8 | 28.57 .26 | 73.0 1.4 |
| Sept. 5.6 | 50.77 .24 | 25.2 1.7 | 57.73 .60 | 17.8 3.0 | 14.38 .25 | 50.7 1.7 | 28.82 .24 | 74.3 1.1 |
| 15.6 | 50.99 .21 | 26.9 1.5 | 58.29 .52 | 20.9 3.2 | 14.62 .22 | 52.4 1.6 | 29.04 .21 | 75.3 0.7 |
| 25.6 | 51.18 .17 | 28.3 1.4 | 58.77 .43 | 24.2 3.4 | 14.82 .19 | 54.0 1.5 | 29.24 .18 | 76.2 0.7 |
| Oct. 5.5 | 51.34 .14 | 29.6 1.2 | 59.16 .34 | 27.6 3.4 | 15.00 .16 | 55.4 1.3 | 29.41 .15 | 76.7 0.5 |
| 15.5 | 51.46 .11 | 30.8 1.0 | 59.44 .24 | 31.0 3.5 | 15.13 .12 | 56.6 1.2 | 29.54 .12 | 77.1 0.3 |
| 25.5 | 51.55 .08 | 31.7 0.9 | 59.63 .13 | 34.5 3.4 | 15.24 .09 | 57.7 1.0 | 29.65 .09 | 77.3 +0.1 |
| Nov. 4.5 | 51.62 .05 | 32.5 0.7 | 59.71 +.03 | 37.9 3.3 | 15.32 .06 | 58.6 0.8 | 29.72 .06 | 77.3 −0.1 |
| 14.4 | 51.65 +.02 | 33.1 0.5 | 59.69 −.08 | 41.1 3.1 | 15.36 +.03 | 59.4 0.7 | 29.77 +.03 | 77.2 0.2 |
| 24.4 | 51.65 −.01 | 33.5 0.3 | 59.56 .18 | 44.1 2.8 | 15.38 .00 | 59.9 0.5 | 29.79 .00 | 76.9 0.3 |
| Dec. 4.4 | 51.62 .04 | 33.7 +0.1 | 59.33 .28 | 46.7 2.5 | 15.36 −.03 | 60.3 0.3 | 29.78 −.02 | 76.6 0.4 |
| 14.3 | 51.57 .06 | 33.8 0.0 | 59.00 .37 | 49.0 2.1 | 15.32 .06 | 60.5 +0.1 | 29.74 .05 | 76.1 0.5 |
| 24.3 | 51.50 .09 | 33.7 −0.2 | 58.59 .45 | 50.8 1.6 | 15.25 .08 | 60.5 −0.1 | 29.68 .07 | 75.6 0.5 |
| 34.3 | 51.40 −.11 | 33.4 −0.4 | 58.11 −.52 | 52.1 +0.1 | 15.16 −.10 | 60.4 −0.3 | 29.59 −.09 | 75.1 −0.5 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *ι Cassiopeæ. | | γ Ceti. | | α Ceti. | | *48 Cephei (H.) | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>2 18 | +66° 50′ | h m<br>2 36 | +2° 42′ | h m<br>2 55 | +3° 36′ | h m<br>3 4 | +77° 16′ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.3 | 52.53 −.34 | 55.7 +1.4 | 53.23 −.07 | 48.8 −0.7 | 48.63 −.06 | 12.7 −0.7 | 41.20 −.56 | 53.7 +2.3 |
| 10.3 | 52.17 .39 | 56.9 0.9 | 53.14 .10 | 48.1 0.6 | 48.55 .09 | 12.1 0.6 | 40.58 .68 | 55.6 1.7 |
| 20.3 | 51.76 .43 | 57.5 +0.3 | 53.04 .12 | 47.5 0.6 | 48.45 .11 | 11.5 0.6 | 39.85 .78 | 57.0 1.1 |
| 30.3 | 51.32 .45 | 57.5 −0.3 | 52.91 .13 | 47.0 0.5 | 48.33 .13 | 10.9 0.5 | 39.04 .84 | 57.8 +0.5 |
| Feb. 9.2 | 50.87 .45 | 57.0 0.8 | 52.78 .14 | 46.6 0.4 | 48.19 .14 | 10.5 0.4 | 38.18 .87 | 58.1 −0.1 |
| 19.2 | 50.44 .42 | 55.9 1.3 | 52.64 .14 | 46.2 0.2 | 48.05 .14 | 10.1 0.3 | 37.31 .86 | 57.7 0.6 |
| 29.2 | 50.04 .38 | 54.5 1.7 | 52.51 .13 | 46.1 −0.1 | 47.91 .13 | 9.9 −0.1 | 36.47 .81 | 56.8 1.2 |
| Mar. 10.1 | 49.69 .31 | 52.6 2.1 | 52.40 .11 | 46.0 0.0 | 47.79 .12 | 9.9 0.0 | 35.69 .73 | 55.3 1.7 |
| 20.1 | 49.42 .23 | 50.4 2.3 | 52.30 .08 | 46.1 +0.2 | 47.68 .10 | 9.9 +0.2 | 35.03 .60 | 53.4 2.1 |
| 30.1 | 49.23 .14 | 48.0 2.5 | 52.24 .05 | 46.5 0.4 | 47.60 .06 | 10.2 0.3 | 34.50 .45 | 51.1 2.4 |
| Apr. 9.1 | 49.15 −.03 | 45.4 2.6 | 52.21 −.01 | 47.0 0.6 | 47.56 −.02 | 10.6 0.5 | 34.13 .28 | 48.6 2.7 |
| 19.0 | 49.18 +.08 | 42.9 2.5 | 52.23 +.04 | 47.7 0.8 | 47.55 +.02 | 11.3 0.7 | 33.94 −.10 | 45.9 2.8 |
| 29.0 | 49.31 .19 | 40.5 2.4 | 52.28 .08 | 48.6 1.0 | 47.59 .06 | 12.1 0.9 | 33.94 +.09 | 43.1 2.8 |
| May 9.0 | 49.55 .29 | 38.2 2.1 | 52.39 .13 | 49.8 1.2 | 47.68 .11 | 13.2 1.2 | 34.12 .28 | 40.4 2.7 |
| 18.9 | 49.89 .39 | 36.2 1.8 | 52.54 .17 | 51.1 1.4 | 47.81 .15 | 14.4 1.3 | 34.49 .46 | 37.8 2.5 |
| 28.9 | 50.33 .48 | 34.6 1.5 | 52.73 .21 | 52.6 1.6 | 47.99 .19 | 15.8 1.5 | 35.04 .63 | 35.5 2.2 |
| June 7.9 | 50.84 .55 | 33.3 1.0 | 52.96 .25 | 54.3 1.7 | 48.20 .23 | 17.4 1.7 | 35.75 .78 | 33.4 1.9 |
| 17.9 | 51.42 .61 | 32.5 0.6 | 53.22 .27 | 56.1 1.8 | 48.45 .26 | 19.1 1.7 | 36.59 .91 | 31.7 1.5 |
| 27.8 | 52.05 .65 | 32.2 −0.1 | 53.50 .29 | 57.9 1.9 | 48.73 .29 | 20.9 1.8 | 37.56 1.01 | 30.5 1.0 |
| July 7.8 | 52.72 .68 | 32.3 +0.3 | 53.80 .31 | 59.8 1.9 | 49.02 .30 | 22.7 1.8 | 38.61 1.09 | 29.7 0.6 |
| 17.8 | 53.40 .69 | 32.8 0.8 | 54.12 .32 | 61.6 1.8 | 49.33 .31 | 24.4 1.8 | 39.73 1.14 | 29.3 −0.1 |
| 27.7 | 54.09 .68 | 33.9 1.2 | 54.43 .32 | 63.4 1.7 | 49.65 .32 | 26.2 1.7 | 40.89 1.17 | 29.4 +0.4 |
| Aug. 6.7 | 54.76 .66 | 35.3 1.6 | 54.75 .31 | 65.0 1.6 | 49.96 .31 | 27.7 1.5 | 42.07 1.18 | 30.0 0.8 |
| 16.7 | 55.41 .63 | 37.1 2.0 | 55.05 .30 | 66.5 1.4 | 50.27 .30 | 29.2 1.3 | 43.23 1.16 | 31.1 1.3 |
| 26.7 | 56.02 .59 | 39.3 2.3 | 55.34 .28 | 67.7 1.1 | 50.56 .29 | 30.4 1.1 | 44.37 1.12 | 32.6 1.7 |
| Sept. 5.6 | 56.59 .54 | 41.8 2.6 | 55.61 .26 | 68.7 0.9 | 50.84 .27 | 31.4 0.9 | 45.47 1.06 | 34.5 2.1 |
| 15.6 | 57.11 .49 | 44.5 2.9 | 55.85 .23 | 69.5 0.6 | 51.10 .25 | 32.1 0.6 | 46.49 .98 | 36.8 2.4 |
| 25.6 | 57.56 .42 | 47.5 3.0 | 56.07 .20 | 70.0 0.4 | 51.33 22 | 32.6 0.4 | 47.43 .89 | 39.3 2.7 |
| Oct. 5.6 | 57.94 .35 | 50.6 3.2 | 56.26 .18 | 70.2 +0.1 | 51.54 .19 | 32.9 +0.1 | 48.26 .78 | 42.2 3.0 |
| 15.5 | 58.26 .27 | 53.8 3.2 | 56.42 .15 | 70.2 −0.1 | 51.72 .17 | 32.9 −0.1 | 48.98 .65 | 45.3 3.2 |
| 25.5 | 58.49 .20 | 57.0 3.2 | 56.55 .12 | 70.0 0.3 | 51.87 .14 | 32.7 0.3 | 49.56 .51 | 48.6 3.3 |
| Nov. 4.5 | 58.64 .11 | 60.2 3.1 | 56.65 .09 | 69.6 0.5 | 51.99 .11 | 32.3 0.5 | 50.00 .36 | 52.0 3.4 |
| 14.4 | 58.71 +.03 | 63.3 3.0 | 56.73 .06 | 69.0 0.6 | 52.08 .08 | 31.7 0.6 | 50.29 .20 | 55.4 3.4 |
| 24.4 | 58.70 −.06 | 66.2 2.8 | 56.77 +.03 | 68.4 0.7 | 52.15 .05 | 31.1 0.7 | 50.41 +.04 | 58.7 3.3 |
| Dec. 4.4 | 58.60 .14 | 68.8 2.5 | 56.78 .00 | 67.7 0.7 | 52.18 +.01 | 30.4 0.7 | 50.36 −.13 | 61.8 3.1 |
| 14.4 | 58.42 .22 | 71.0 2.1 | 56.77 −.03 | 66.9 0.8 | 52.17 −.02 | 29.6 0.7 | 50.14 .30 | 64.8 2.8 |
| 24.3 | 58.16 .29 | 72.9 1.7 | 56.72 .06 | 66.2 0.7 | 52.14 .05 | 28.9 0.7 | 49.76 .46 | 67.4 2.4 |
| 34.3 | 57.84 −.36 | 74.3 +1.1 | 56.65 −.09 | 65.4 −0.7 | 52.08 −.08 | 28.2 −0.7 | 49.24 −.60 | 69.6 +1.9 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ζ Arietis. | | α Persei. | | δ Persei. | | η Tauri. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>3 7 | +20° 35′ | h m<br>3 15 | +49° 25′ | h m<br>3 34 | +47° 23′ | h m<br>3 40 | +23° 43′ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.4 | 47.29 −.06 | 12.3 0.0 | 29.47 −.11 | 21.4 +1.2 | 7.00 −.08 | 36.5 +1.2 | 7.80 −.04 | 23.7 +0.1 |
| 10.3 | 47.21 .09 | 12.2 −0.2 | 29.34 .15 | 22.5 0.9 | 6.90 .13 | 37.5 0.9 | 7.75 .07 | 23.8 0.0 |
| 20.3 | 47.11 .12 | 12.0 0.3 | 29.16 .19 | 23.2 0.5 | 6.75 .17 | 38.3 0.6 | 7.66 .11 | 23.8 −0.1 |
| 30.3 | 46.98 .14 | 11.7 0.4 | 28.95 .22 | 23.5 +0.1 | 6.56 .21 | 38.8 +0.3 | 7.54 .13 | 23.7 0.2 |
| Feb. 9.2 | 46.84 .15 | 11.3 0.5 | 28.72 .24 | 23.4 −0.3 | 6.34 .23 | 38.8 −0.1 | 7.39 .15 | 23.4 0.3 |
| 19.2 | 46.69 .15 | 10.8 0.5 | 28.47 .25 | 23.0 0.6 | 6.11 .24 | 38.6 0.5 | 7.23 .16 | 23.1 0.4 |
| 29.2 | 46.53 .15 | 10.3 0.6 | 28.23 .24 | 22.2 1.0 | 5.87 .23 | 38.0 0.8 | 7.07 .16 | 22.7 0.5 |
| Mar. 10.2 | 46.39 .13 | 9.7 0.6 | 28.00 .22 | 21.1 1.3 | 5.64 .22 | 37.0 1.1 | 6.91 .15 | 22.2 0.5 |
| 20.1 | 46.27 .11 | 9.1 0.6 | 27.80 .18 | 19.7 1.5 | 5.44 .19 | 35.9 1.3 | 6.77 .13 | 21.6 0.6 |
| 30.1 | 46.18 .07 | 8.6 0.5 | 27.65 .13 | 18.1 1.7 | 5.28 .14 | 34.5 1.5 | 6.65 .10 | 21.0 0.6 |
| Apr. 9.1 | 46.13 −.03 | 8.2 0.4 | 27.55 .07 | 16.4 1.7 | 5.16 .09 | 32.9 1.6 | 6.57 .06 | 20.5 0.5 |
| 19.1 | 46.12 +.01 | 7.8 0.3 | 27.51 −.01 | 14.7 1.7 | 5.10 −.03 | 31.3 1.6 | 6.53 −.02 | 20.0 0.4 |
| 29.0 | 46.15 .06 | 7.7 −0.1 | 27.54 +.06 | 13.0 1.7 | 5.11 +.04 | 29.7 1.6 | 6.53 +.03 | 19.7 0.3 |
| May 9.0 | 46.24 .11 | 7.7 +0.1 | 27.63 .13 | 11.3 1.5 | 5.17 .10 | 28.2 1.5 | 6.59 .08 | 19.4 −0.2 |
| 19.0 | 46.38 .16 | 7.9 0.3 | 27.80 .20 | 9.9 1.3 | 5.31 .17 | 26.8 1.3 | 6.69 .13 | 19.4 0.0 |
| 28.9 | 46.56 .20 | 8.3 0.5 | 28.03 .26 | 8.7 1.1 | 5.51 .23 | 25.6 1.1 | 6.85 .18 | 19.5 +0.2 |
| June 7.9 | 46.78 .24 | 9.0 0.7 | 28.32 .31 | 7.7 0.8 | 5.77 .29 | 24.6 0.8 | 7.05 .22 | 19.8 0.4 |
| 17.9 | 47.04 .28 | 9.8 0.9 | 28.66 .36 | 7.1 0.5 | 6.08 .33 | 23.9 0.6 | 7.29 .26 | 20.3 0.6 |
| 27.9 | 47.33 .30 | 10.8 1.1 | 29.04 .40 | 6.8 −0.2 | 6.44 .37 | 23.5 −0.3 | 7.56 .29 | 21.0 0.8 |
| July 7.8 | 47.64 .32 | 12.0 1.2 | 29.45 .43 | 6.8 +0.2 | 6.83 .40 | 23.4 +0.1 | 7.86 .31 | 21.9 0.9 |
| 17.8 | 47.97 .33 | 13.3 1.4 | 29.89 .45 | 7.1 0.5 | 7.24 .42 | 23.6 0.4 | 8.18 .33 | 22.8 1.0 |
| 27.8 | 48.30 .34 | 14.7 1.4 | 30.34 .45 | 7.8 0.8 | 7.67 .44 | 24.1 0.6 | 8.52 .34 | 23.9 1.1 |
| Aug. 6.8 | 48.64 .33 | 16.1 1.5 | 30.80 .46 | 8.7 1.1 | 8.11 .44 | 24.9 0.9 | 8.85 .34 | 25.1 1.2 |
| 16.7 | 48.97 .32 | 17.6 1.4 | 31.25 .45 | 9.9 1.4 | 8.55 .44 | 25.9 1.1 | 9.19 .34 | 26.3 1.2 |
| 26.7 | 49.28 .31 | 19.0 1.4 | 31.69 .43 | 11.4 1.6 | 8.98 .43 | 27.1 1.3 | 9.53 .33 | 27.5 1.2 |
| Sept. 5.7 | 49.59 .29 | 20.3 1.3 | 32.11 .41 | 13.1 1.8 | 9.40 .41 | 28.6 1.5 | 9.85 .32 | 28.7 1.2 |
| 15.6 | 49.87 .27 | 21.6 1.2 | 32.50 .38 | 14.9 1.9 | 9.80 .39 | 30.2 1.7 | 10.15 .30 | 29.8 1.1 |
| 25.6 | 50.13 .25 | 22.7 1.1 | 32.87 .35 | 16.9 2.1 | 10.17 .36 | 32.0 1.8 | 10.44 .28 | 30.9 1.0 |
| Oct. 5.6 | 50.36 .22 | 23.7 0.9 | 33.20 .32 | 19.0 2.2 | 10.51 .33 | 33.8 1.9 | 10.71 .26 | 31.8 0.9 |
| 15.6 | 50.57 .19 | 24.6 0.8 | 33.50 .28 | 21.2 2.2 | 10.82 .29 | 35.8 2.0 | 10.95 .23 | 32.7 0.8 |
| 25.5 | 50.75 .16 | 25.3 0.7 | 33.75 .23 | 23.4 2.2 | 11.10 .25 | 37.7 2.0 | 11.17 .20 | 33.4 0.7 |
| Nov. 4.5 | 50.90 .13 | 25.9 0.5 | 33.96 .19 | 25.6 2.2 | 11.33 .21 | 39.7 2.0 | 11.36 .17 | 34.1 0.6 |
| 14.5 | 51.02 .10 | 26.4 0.4 | 34.13 .14 | 27.8 2.1 | 11.52 .17 | 41.7 1.9 | 11.51 .14 | 34.7 0.5 |
| 24.5 | 51.10 .07 | 26.8 0.3 | 34.24 .09 | 29.9 2.0 | 11.66 .12 | 43.6 1.9 | 11.63 .10 | 35.2 0.4 |
| Dec. 4.4 | 51.15 +.03 | 27.0 0.2 | 34.30 +.03 | 31.8 1.8 | 11.75 .06 | 45.4 1.8 | 11.72 .07 | 35.6 0.4 |
| 14.4 | 51.17 .00 | 27.2 +0.1 | 34.31 −.02 | 33.5 1.6 | 11.79 +.01 | 47.1 1.6 | 11.77 +.03 | 35.9 0.3 |
| 24.4 | 51.15 −.04 | 27.2 0.0 | 34.27 .07 | 35.0 1.4 | 11.77 −.05 | 48.6 1.4 | 11.78 −.01 | 36.1 0.2 |
| 34.4 | 51.09 −.07 | 27.2 −0.1 | 34.17 −.13 | 36.2 +1.1 | 11.70 −.09 | 49.8 +1.1 | 11.74 −.05 | 36.2 +0.1 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ζ Persei. | | γ¹ Eridani. | | γ Tauri. | | ε Tauri. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 3 46 | +31 30 | 3 52 | −13 51 | 4 12 | +15 19 | 4 21 | +18 54 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.4 | 21.35 −.04 | 62.0 +0.5 | 15.76 −.04 | 41.6 −1.5 | 45.31 −.01 | 45.5 −0.3 | 23.70 .00 | 24.1 −0.1 |
| 10.3 | 21:29 .08 | 62.4 0.4 | 15.70 .08 | 42.9 1.3 | 45.28 .05 | 45.3 0.3 | 23.68 −.04 | 24.0 0.1 |
| 20.3 | 21.20 .11 | 62.7 +0.2 | 15.60 .11 | 44.1 1.1 | 45.22 .08 | 45.0 0.3 | 23.62 .08 | 23.9 0.1 |
| 30.3 | 21.07 .15 | 62.8 0.0 | 15.48 .14 | 45.0 0.8 | 45.12 .12 | 44.7 0.3 | 23.52 .11 | 23.8 0.2 |
| Feb. 9.3 | 20.91 .17 | 62.7 −0.2 | 15.33 .16 | 45.7 0.5 | 44.99 .14 | 44.5 0.3 | 23.39 .14 | 23.6 0.2 |
| 19.2 | 20.74 .18 | 62.4 0.4 | 15.17 .17 | 46.0 −0.2 | 44.84 .16 | 44.2 0.3 | 23.24 .16 | 23.4 0.2 |
| 29.2 | 20.56 .18 | 62.0 0.5 | 15.00 .17 | 46.0 +0.1 | 44.68 .16 | 43.9 0.3 | 23.08 .17 | 23.1 0.3 |
| Mar. 10.2 | 20.38 .17 | 61.4 0.7 | 14.84 .16 | 45 8 0.4 | 44.52 .16 | 43.6 0.3 | 22.92 .16 | 22.8 0.3 |
| 20.2 | 20.22 .15 | 60.7 0.8 | 14.68 .14 | 45.2 0.7 | 44.37 .14 | 43.4 0.2 | 22.76 .15 | 22.5 0.3 |
| 30.1 | 20.09 .12 | 59.8 0.9 | 14.55 .12 | 44.4 1.0 | 44.24 .12 | 43.2 0.2 | 22.62 .13 | 22.3 0.3 |
| Apr. 9.1 | 20.00 .08 | 59.0 0.9 | 14.45 .09 | 43.3 1.2 | 44.14 .08 | 43.1 −0.1 | 22.51 .09 | 22.0 0.2 |
| 19.1 | 19.94 −.03 | 58.1 0.8 | 14.38 −.05 | 41.9 1.5 | 44.07 −.05 | 43.1 0.0 | 22.44 .05 | 21.8 0.2 |
| 29.0 | 19.94 +.03 | 57.3 0.7 | 14.36 .00 | 40.3 1.7 | 44.05 .00 | 43.2 +0.2 | 22.41 −.01 | 21.7 −0.1 |
| May 9.0 | 20.00 .08 | 56.6 0.6 | 14.38 +.04 | 38.4 2.0 | 44.07 +.04 | 43.4 0.3 | 22.42 +.04 | 21.7 +0.1 |
| 19.0 | 20.10 .13 | 56.1 0.5 | 14.45 .09 | 36.4 2.1 | 44.14 .09 | 43.7 0.4 | 22.49 .09 | 21.8 0.2 |
| 29.0 | 20.26 .18 | 55.8 0.3 | 14.56 .13 | 34.2 2.2 | 44.25 .14 | 44.2 0.6 | 22.60 .13 | 22.1 0.4 |
| June 7.9 | 20.46 .23 | 55.6 −0.1 | 14.71 .18 | 31.9 2.3 | 44.41 .18 | 44.9 0.7 | 22.75 .18 | 22.6 0.5 |
| 17.9 | 20.72 .27 | 55.6 +0.2 | 14.90 .21 | 29.6 2.3 | 44.61 .22 | 45.7 0.9 | 22.95 .22 | 23.1 0.6 |
| 27.9 | 21.00 .30 | 55.9 0.4 | 15.13 .24 | 27.2 2.3 | 44.85 .25 | 46.6 1.0 | 23.18 .25 | 23.8 0.8 |
| July 7.9 | 21.32 .33 | 56.4 0.6 | 15.39 .27 | 25.0 2.2 | 45.11 .28 | 47.7 1.1 | 23.45 .28 | 24.6 0.9 |
| 17.8 | 21.66 .35 | 57.0 0.7 | 15.67 .29 | 22.8 2.0 | 45.40 .30 | 48.8 1.1 | 23.74 .30 | 25.6 1.0 |
| 27.8 | 22.01 .36 | 57.9 0.9 | 15.96 .30 | 20.9 1.8 | 45.71 .31 | 49.9 1.1 | 24.04 .31 | 26.5 1.0 |
| Aug. 6.8 | 22.37 .36 | 58.8 1.0 | 16.27 .31 | 19.2 1.5 | 46.02 .32 | 51.0 1.1 | 24.36 .32 | 27.5 1.0 |
| 16.7 | 22.73 .36 | 59.9 1.1 | 16.57 .31 | 17.9 1.2 | 46.34 .32 | 52.1 1.1 | 24.69 .33 | 28.5 1.0 |
| 26.7 | 23.09 .35 | 61.1 1.2 | 16.88 .30 | 16.9 0.8 | 46.66 .32 | 53.1 1.0 | 25.01 .33 | 29.4 0.9 |
| Sept. 5.7 | 23.43 .34 | 62.3 1.2 | 17.17 .29 | 16.2 +0.4 | 46.98 .31 | 54.0 0.8 | 25.34 .32 | 30.3 0.8 |
| 15.7 | 23.76 .32 | 63.5 1.2 | 17.46 .28 | 16.0 0.0 | 47.28 .30 | 54.8 0.7 | 25.65 .31 | 31.0 0.7 |
| 25.6 | 24.07 .30 | 61.7 1.2 | 17.72 .26 | 16.2 −0.4 | 47 57 .28 | 55.4 0.5 | 25.95 .29 | 31.7 0.6 |
| Oct. 5.6 | 24.36 .28 | 65.9 1.2 | 17.97 .23 | 16.8 0.8 | 47.85 .27 | 55.9 0.4 | 26.23 .28 | 32.2 0.5 |
| 15.6 | 24.63 .25 | 67.1 1.2 | 18.19 .21 | 17.7 1.1 | 48.10 .25 | 56.2 0.2 | 26.50 .26 | 32.6 0.4 |
| 25.6 | 24.87 .22 | 68.2 1.1 | 18.39 .18 | 18.9 1.4 | 48.34 .22 | 56.3 +0.1 | 26.75 .24 | 32.9 0.2 |
| Nov. 4.5 | 25.08 .19 | 69.3 1.1 | 18.55 .15 | 20.4 1.6 | 48.54 .20 | 56.4 0.0 | 26.97 .21 | 33.1 0.2 |
| 14.5 | 25.25 .16 | 70.3 1.0 | 18.69 .12 | 22.0 1.7 | 48.72 .17 | 56.3 −0.1 | 27.16 .18 | 33.2 +0.1 |
| 24.5 | 25.39 .12 | 71.3 0.9 | 18.80 .09 | 23.8 1.8 | 48.87 .13 | 56.2 0.2 | 27.33 .14 | 33.3 0.0 |
| Dec. 4.4 | 25.48 .08 | 72.1 0.8 | 18.86 .05 | 25.7 1.8 | 48.99 .10 | 56.0 0.2 | 27.45 .11 | 33.3 0.0 |
| 14.4 | 25.54 +.03 | 72.9 0.7 | 18.89 +.01 | 27.5 1.8 | 49.06 .06 | 55.7 0.3 | 27.54 .07 | 33.2 −0.1 |
| 24.4 | 25.55 −.01 | 73.6 0.6 | 18.89 −.02 | 29.2 1.6 | 49.10 +.02 | 55.5 0.3 | 27.59 +.03 | 33.2 0.1 |
| 34.4 | 25.52 −.05 | 74.1 +0.4 | 18.85 −.06 | 30.7 −1.5 | 49.10 −.03 | 55.2 −0.3 | 27.59 −.02 | 33.1 −0.1 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *α* Tauri. (*Aldebaran.*) | | *9 Camelopardalis. | | *ι* Aurigæ. | | 11 Orionis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>4 28 | +16° 15′ | h m<br>4 41 | +66° 7′ | h m<br>4 48 | +32° 58′ | h m<br>4 57 | +15° 13′ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.4 | 49.51 +.01 | 40.1 −0.2 | 46.38 −.05 | 60.5 +2.4 | 56.49 +.03 | 16.2 +0.7 | 30.33 +.03 | 56.3 −0.3 |
| 10.4 | 49.49 −.04 | 39.8 0.2 | 46.27 .15 | 62.8 2.1 | 56.49 −.03 | 16.8 0.6 | 30.33 −.01 | 56.0 0.3 |
| 20.4 | 49.44 .08 | 39.6 0.2 | 46.08 .24 | 64.7 1.8 | 56.44 .07 | 17.4 0.5 | 30.30 .05 | 55.7 0.2 |
| 30.3 | 49.34 .11 | 39.4 0.2 | 45.79 .32 | 66.3 1.4 | 56.35 .12 | 17.9 0.4 | 30.22 .09 | 55.5 0.2 |
| Feb. 9.3 | 49.22 .14 | 39.2 0.2 | 45.44 .39 | 67.5 1.0 | 56.21 .15 | 18.2 0.2 | 30.11 .13 | 55.3 0.2 |
| 19.3 | 49.07 .16 | 38.9 0.2 | 45.03 .43 | 68.3 +0.5 | 56.05 .18 | 18.3 +0.1 | 29.97 .15 | 55.1 0.2 |
| 29.2 | 48.91 .16 | 38.7 0.3 | 44.59 .45 | 68.5 0.0 | 55.86 .19 | 18.3 −0.1 | 29.82 .16 | 54.9 0.2 |
| Mar. 10.2 | 48.75 .16 | 38.5 0.2 | 44.14 .45 | 68.2 −0.5 | 55.67 .19 | 18.0 0.3 | 29.65 .17 | 54.7 0.2 |
| 20.2 | 48.59 .15 | 38.2 0.2 | 43.71 .42 | 67.5 1.0 | 55 48 .18 | 17.7 0.5 | 29.49 .16 | 54.6 0.1 |
| 30.2 | 48.45 .13 | 38.0 0.2 | 43.31 .37 | 66.3 1.4 | 55.31 .16 | 17.1 0.6 | 29.34 .14 | 54.5 −0.1 |
| Apr. 9.1 | 48.34 .10 | 37.9 −0.1 | 42.98 .30 | 64.8 1.7 | 55.17 .13 | 16.5 0.7 | 29.21 .12 | 54.4 0.0 |
| 19.1 | 48.26 .06 | 37.8 0.0 | 42.72 .22 | 62.9 2.0 | 55.06 .09 | 15.8 0.7 | 29.11 .08 | 54.4 0.0 |
| 29.1 | 48.22 −.02 | 37.8 +0.1 | 42.55 .12 | 60.8 2.2 | 55.00 −.04 | 15.0 0.8 | 29.05 −.04 | 54.5 +0.1 |
| May 9.1 | 48.23 +.03 | 38.0 0.2 | 42.48 −.02 | 58.6 2.3 | 54.99 +.02 | 14.3 0.7 | 29.03 .00 | 54.7 0.2 |
| 19.0 | 48.28 .08 | 38.2 0.3 | 42.51 +.09 | 56.2 2.3 | 55.03 .07 | 13.6 0.7 | 29.06 +.05 | 54.9 0.4 |
| 29.0 | 48.39 .12 | 38.6 0.5 | 42.65 .19 | 53.9 2.3 | 55.12 .12 | 13.0 0.6 | 29.13 .10 | 55.3 0.5 |
| June 8.0 | 48.53 .17 | 39.2 0.6 | 42.88 .29 | 51.7 2.1 | 55.26 .17 | 12.5 0.4 | 29.25 .14 | 55.9 0.6 |
| 17.9 | 48.72 .21 | 39.9 0.8 | 43.22 .38 | 49.7 2.0 | 55.46 .21 | 12.1 0.3 | 29.41 .18 | 56.5 0.7 |
| 27.9 | 48.94 .24 | 40.7 0.9 | 43.64 .46 | 47.9 1.7 | 55.69 .26 | 11.9 −0.1 | 29.61 .22 | 57.2 0.8 |
| July 7.9 | 49.20 .27 | 41.6 1.0 | 44.13 .53 | 46.3 1.4 | 55.96 .29 | 11.8 0.0 | 29.84 .25 | 58.1 0.8 |
| 17.9 | 49.48 .29 | 42.6 1.0 | 44.69 .59 | 45.1 1.1 | 56.27 .32 | 11.9 +0.2 | 30.10 .27 | 58.9 0.9 |
| 27.8 | 49.78 .31 | 43.6 1.0 | 45.30 .63 | 44.1 0.8 | 56.59 .34 | 12.1 0.3 | 30.38 .29 | 59.8 0.9 |
| Aug. 6.8 | 50.09 .32 | 44.6 1.0 | 45.95 .67 | 43.5 0.4 | 56.94 .35 | 12.5 0.4 | 30.68 .30 | 60.7 0.9 |
| 16.8 | 50.41 .32 | 45.6 1.0 | 46.63 .69 | 43.3 −0.1 | 57.29 .36 | 12.9 0.5 | 30.99 .31 | 61.5 0.8 |
| 26.8 | 50.73 .32 | 46.5 0.9 | 47.32 .70 | 43.4 +0.3 | 57.66 .36 | 13.5 0.6 | 31.30 .32 | 62.3 0.7 |
| Sept. 5.7 | 51.04 .31 | 47.3 0.7 | 48.02 .70 | 43.9 0.7 | 58.02 .36 | 14.1 0.6 | 31.61 .32 | 62.9 0.6 |
| 15.7 | 51.35 .31 | 47.9 0.6 | 48.71 .68 | 44.7 1.0 | 58.37 .35 | 14.8 0.7 | 31.93 .31 | 63.4 0.4 |
| 25.7 | 51.65 .29 | 48.5 0.5 | 49.38 .66 | 45.9 1.3 | 58.72 .35 | 15.5 0.7 | 32.24 .30 | 63.8 0.3 |
| Oct. 5.6 | 51.94 .28 | 48.9 0.3 | 50.03 .63 | 47.3 1.6 | 59.06 .33 | 16.2 0.7 | 32.53 .29 | 64.0 +0.1 |
| 15.6 | 52.21 .26 | 49.2 0.2 | 50.64 .59 | 49.1 1.9 | 59.39 .31 | 16.9 0.7 | 32.82 .28 | 64.1 0.0 |
| 25.6 | 52.45 .24 | 49.3 +0.1 | 51.20 .53 | 51.1 2.1 | 59.69 .29 | 17.6 0.8 | 33.08 .26 | 64.0 −0.1 |
| Nov. 4.6 | 52.68 .21 | 49.3 0.0 | 51.70 .47 | 53.4 2.3 | 59.96 .26 | 18.4 0.8 | 33.33 .24 | 63.9 0.2 |
| 14.5 | 52.87 .18 | 49.2 −0.1 | 52.13 .39 | 55.8 2.5 | 60.21 .23 | 19.2 0.8 | 33.55 .21 | 63.6 0.3 |
| 24.5 | 53.04 .15 | 49.1 0.2 | 52.48 .31 | 58.3 2.6 | 60.42 .19 | 19.9 0.8 | 33.75 .18 | 63.2 0.3 |
| Dec. 4.5 | 53.17 .11 | 48.8 0.2 | 52.75 .22 | 61.0 2.6 | 60.60 .15 | 20.7 0.8 | 33.91 .14 | 62.9 0.4 |
| 14.5 | 53.26 .07 | 48.6 0.2 | 52.92 .12 | 63.6 2.6 | 60.72 .10 | 21.5 0.8 | 34.03 .10 | 62.5 0.4 |
| 24.4 | 53.32 +.03 | 48.4 0.2 | 52.98 +.02 | 66.1 2.5 | 60.80 .06 | 22.2 0.7 | 34.11 .06 | 62.2 0.4 |
| 34.4 | 53.33 −.02 | 48.2 −0.3 | 52.95 −.09 | 68.5 +2.3 | 60.83 +.01 | 22.9 +0.7 | 34.14 +.02 | 61.8 −0.4 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *a* Aurigæ. (*Capella.*) Right Ascension. | *a* Aurigæ. (*Capella.*) Declination *North.* | *β* Orionis. (*Rigel.*) Right Ascension. | *β* Orionis. (*Rigel.*) Declination *South.* | *β* Tauri. Right Ascension. | *β* Tauri. Declination *North.* | *Groombridge 966. Right Ascension. | *Groombridge 966. Declination *North.* |
|---|---|---|---|---|---|---|---|---|
| | h m<br>5 7 | ° ′<br>+45 52 | h m<br>5 8 | ° ′<br>–8 20 | h m<br>5 18 | ° ′<br>+28 30 | h m<br>5 23 | ° ′<br>+74 57 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.4 | 33.49 +.04 | 22.8 +1.4 | 36.00 +.02 | 41.3 –1.6 | 28.60 +.06 | 12.7 +0.5 | 14.16 +.02 | 39.1 +2.9 |
| 10.4 | 33.50 –.02 | 24.2 1.3 | 36.00 –.02 | 42.8 1.4 | 28.63 +.01 | 13.1 0.4 | 14.09 –.15 | 41.9 2.7 |
| 20.4 | 33.45 .08 | 25.5 1.2 | 35.96 .06 | 44.1 1.3 | 28.61 –.04 | 13.5 0.4 | 13.86 .31 | 44.5 2.4 |
| 30.4 | 33.34 .13 | 26.5 0.9 | 35.88 .10 | 45.3 1.0 | 28.55 .09 | 13.9 0.3 | 13.48 .45 | 46.7 2.0 |
| Feb. 9.3 | 33.19 .18 | 27.3 0.7 | 35.77 .13 | 46.2 0.8 | 28.44 .13 | 14.1 0.2 | 12.97 .57 | 48.5 1.6 |
| 19.3 | 32.99 .21 | 27.9 0.4 | 35.62 .15 | 46.8 0.5 | 28.29 .16 | 14.3 +0.1 | 12.35 .66 | 49.9 1.1 |
| 29.3 | 32.76 .23 | 28.1 +0.1 | 35.46 .17 | 47.3 –0.3 | 28.13 .18 | 14.4 0.0 | 11.66 .71 | 50.8 +0.6 |
| Mar. 10.2 | 32.52 .24 | 28.1 –0.2 | 35.29 .17 | 47.4 0.0 | 27.94 .19 | 14.3 –0.1 | 10.93 .73 | 51.1 0.0 |
| 20.2 | 32.29 .23 | 27.7 0.5 | 35.12 .17 | 47.3 +0 2 | 27.76 .18 | 14.1 0.2 | 10.20 .72 | 50.8 –0.5 |
| 30.2 | 32.06 .21 | 27.0 0.8 | 34.96 .15 | 47.0 0.5 | 27.59 .17 | 13.9 0.3 | 9.51 .67 | 50.1 1.0 |
| Apr. 9.2 | 31.87 .17 | 26.2 1.0 | 34.81 .13 | 46.4 0.7 | 27.43 .14 | 13.5 0.4 | 8.88 .59 | 48.8 1.5 |
| 19.1 | 31.72 .13 | 25.1 1.2 | 34.70 .10 | 45.5 1.0 | 27.31 .10 | 13.0 0.5 | 8.34 .48 | 47.1 1.9 |
| 29.1 | 31.62 .07 | 23.8 1.3 | 34.62 .06 | 44.4 1.2 | 27.23 .06 | 12.5 0.5 | 7.92 .35 | 45.0 2.2 |
| May 9.1 | 31.57 –.02 | 22.5 1.4 | 34.58 –.02 | 43.2 1.4 | 27.19 –.01 | 12.1 0.5 | 7.64 .21 | 42.7 2.4 |
| 19.1 | 31.59 +.05 | 21.1 1.4 | 34.58 +.02 | 41.7 1.6 | 27.21 +.04 | 11.6 0.4 | 7.50 –.06 | 40.2 2.6 |
| 29.0 | 31.67 .11 | 19.7 1.3 | 34.62 .07 | 40.0 1.7 | 27.27 .08 | 11.2 0.4 | 7.52 +.10 | 37.6 2.7 |
| June 8.0 | 31.81 .17 | 18.4 1.2 | 34.71 .11 | 38.2 1.9 | 27.37 .13 | 10.8 0.3 | 7.70 .25 | 34.9 2 6 |
| 18.0 | 32.00 .22 | 17.3 1.1 | 34.84 .15 | 36.3 1.9 | 27.53 .18 | 10.6 0.2 | 8 03 .40 | 32.3 2.5 |
| 27.9 | 32.25 .27 | 16.2 1.0 | 35.00 .18 | 34.4 2.0 | 27.73 .22 | 10.5 –0.1 | 8.49 .54 | 29.9 2.4 |
| July 7.9 | 32.55 .32 | 15.3 0.8 | 35.20 .22 | 32.4 1.9 | 27.96 .25 | 10.5 0.0 | 9.09 .66 | 27.6 2.2 |
| 17.9 | 32.89 .35 | 14.7 0.6 | 35.43 .24 | 30.5 1.8 | 28.23 .28 | 10.6 +0.1 | 9.81 .77 | 25.6 1.9 |
| 27.9 | 33.26 .38 | 14.2 0.4 | 35.68 .26 | 28.8 1.7 | 28.53 .31 | 10.8 0.2 | 10.63 .86 | 23.9 1.6 |
| Aug. 6.8 | 33.65 .41 | 13.9 –0.2 | 35.95 .28 | 27.2 1.5 | 28.84 .32 | 11.0 0.3 | 11.53 .94 | 22.5 1.2 |
| 16.8 | 34.06 .42 | 13.8 0.0 | 36.24 .29 | 25.8 1.2 | 29.17 .34 | 11.3 0.3 | 12.50 1.00 | 21.4 0.9 |
| 26.8 | 34.49 .43 | 13.9 +0.2 | 36.53 .30 | 24.8 0.9 | 29.51 .34 | 11.7 0.4 | 13.52 1.04 | 20.8 0.5 |
| Sept. 5.8 | 34.91 .43 | 14.2 0.4 | 36.83 .30 | 24.0 0.6 | 29.86 .35 | 12.0 0.4 | 14.56 1.06 | 20.5 –0.1 |
| 15.7 | 35.34 .43 | 14.6 0.5 | 37.13 .29 | 23.6 +0.2 | 30.20 .34 | 12.4 0.4 | 15.63 1.06 | 20.7 +0.3 |
| 25.7 | 35.76 .42 | 15.3 0.7 | 37.42 .29 | 23.6 –0.2 | 30.54 .34 | 12.8 0.4 | 16.69 1.05 | 21.2 0.7 |
| Oct. 5.7 | 36.17 .40 | 16.0 0.8 | 37.70 .28 | 24.0 0.6 | 30.88 .33 | 13.1 0.3 | 17.72 1.02 | 22.1 1.1 |
| 15.6 | 36.57 .39 | 16.9 1.0 | 37.97 .26 | 24.7 0.9 | 31.21 .32 | 13.4 0.3 | 18.72 .97 | 23.5 1.5 |
| 25 6 | 36.94 .36 | 18.0 1.1 | 38.23 .25 | 25.7 1.2 | 31.52 .30 | 13.7 0.3 | 19.66 .90 | 25.2 1.9 |
| Nov. 4.6 | 37.29 .33 | 19.2 1.2 | 38.46 .22 | 27.0 1.4 | 31.81 .28 | 14.1 0.3 | 20.52 .82 | 27.2 2.2 |
| 14.6 | 37.60 .29 | 20.5 1.3 | 38.67 .20 | 28.6 1.6 | 32.07 .25 | 14.4 0.3 | 21.29 .71 | 29.5 2.5 |
| 24.5 | 37.87 .25 | 21.8 1.4 | 38.86 .17 | 30.3 1.8 | 32.31 .22 | 14.7 0.4 | 21.93 .58 | 32.1 2.7 |
| Dec. 4.5 | 38.09 .20 | 23.3 1.5 | 39.00 .13 | 32.1 1.8 | 32.51 .18 | 15.1 0.4 | 22.45 .44 | 34.8 2.8 |
| 14.5 | 38.27 .14 | 24.8 1.5 | 39.12 .09 | 33.9 1.8 | 32.66 .13 | 15.5 0.4 | 22.81 .28 | 37.7 2.9 |
| 24.5 | 38.38 .08 | 26.2 1.5 | 39.19 .05 | 35.6 1.7 | 32.77 .09 | 15.9 0.4 | 23.01 +.12 | 40.6 2.9 |
| 34.4 | 38.43 +.02 | 27.6 +1.3 | 39.21 +.01 | 37.2 –1.6 | 32.84 +.04 | 16.3 +0.4 | 23.05 –.05 | 43.4 +2.8 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | δ Orionis. | | α Leporis. | | ε Orionis. | | α Columbæ. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* |
| | $5^h 25^m$ | $-0^\circ 23'$ | $5^h 27^m$ | $-17^\circ 54'$ | $5^h 29^m$ | $-1^\circ 16'$ | $5^h 35^m$ | $-34^\circ 7'$ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.4 | 41.62 +.05 | 26.7 −1.3 | 17.12 +.03 | 39.0 −2.1 | 56.58 +.06 | 50.9 −1.3 | 11.22 +.01 | 83.8 −2.8 |
| 10.4 | 41.65 .00 | 27.9 1.1 | 17.13 −.02 | 41.1 1.9 | 56.61 +.01 | 52.2 1.2 | 11.20 −.04 | 86.5 2.6 |
| 20.4 | 41.63 −.04 | 28.9 1.0 | 17.09 .06 | 42.9 1.7 | 56.59 −.04 | 53.3 1.0 | 11.13 .10 | 88.9 2.3 |
| 30.4 | 41.56 .08 | 29.8 0.8 | 17.01 .10 | 44.5 1.4 | 56.53 .08 | 54.3 0.9 | 11.01 .14 | 91.0 1.9 |
| Feb. 9.3 | 41.46 .12 | 30.6 0.6 | 16.88 .14 | 45.7 1.1 | 56.43 .11 | 55.0 0.7 | 10.85 .18 | 92.7 1.5 |
| 19.3 | 41.33 .14 | 31.1 0.5 | 16.73 .16 | 46.7 0.8 | 56.30 .14 | 55.6 0.5 | 10.66 .21 | 94.0 1.1 |
| 29.3 | 41.18 .16 | 31.5 0.3 | 16.56 .18 | 47.3 0.4 | 56.15 .16 | 56.0 0.3 | 10.44 .23 | 94.8 0.6 |
| Mar. 10.3 | 41.02 .17 | 31.7 −0.1 | 16.38 .19 | 47.6 −0.1 | 55.99 .17 | 56.2 −0.1 | 10.21 .24 | 95.2 −0.2 |
| 20.2 | 40.85 .17 | 31.7 +0.1 | 16.19 .19 | 47.5 +0.3 | 55.82 .17 | 56.2 +0.1 | 9.97 .24 | 95.1 +0.3 |
| 30.2 | 40.69 .15 | 31.5 0.3 | 16.00 .17 | 47.1 0.6 | 55.66 .16 | 56.0 0.3 | 9.74 .22 | 94.6 0.7 |
| Apr. 9.2 | 40.55 .13 | 31.2 0.4 | 15.84 .15 | 46.3 0.9 | 55.51 .13 | 55.7 0.5 | 9.53 .20 | 93.7 1.1 |
| 19.1 | 40.43 .10 | 30.6 0.6 | 15.70 .12 | 45.3 1.2 | 55.39 .10 | 55.1 0.6 | 9.34 .17 | 92.3 1.5 |
| 29.1 | 40.34 .07 | 29.9 0.8 | 15.59 .09 | 44.0 1.5 | 55.30 .07 | 54.4 0.8 | 9.19 .13 | 90.6 1.9 |
| May 9.1 | 40.30 −.03 | 29.0 1.0 | 15.52 .05 | 42.4 1.7 | 55.25 −.03 | 53.5 1.0 | 9.08 .09 | 88.5 2.2 |
| 19.1 | 40.29 +.02 | 28.0 1.1 | 15.50 −.01 | 40.5 1.9 | 55.24 +.01 | 52.4 1.2 | 9.01 −.05 | 86.2 2.5 |
| 29.0 | 40.33 .06 | 26.8 1.3 | 15.51 +.04 | 38.5 2.1 | 55.27 .05 | 51.2 1.3 | 8.99 .00 | 83.6 2.7 |
| June 8.0 | 40.41 .10 | 25.5 1.4 | 15.57 .08 | 36.3 2.3 | 55.35 .10 | 49.8 1.4 | 9.01 +.05 | 80.8 2.9 |
| 18.0 | 40.53 .14 | 24.0 1.5 | 15.68 .12 | 34.0 2.3 | 55.46 .14 | 48.3 1.5 | 9.09 .10 | 77.9 2.9 |
| 28.0 | 40.68 .18 | 22.5 1.5 | 15.82 .16 | 31.7 2.3 | 55.62 .17 | 46.8 1.5 | 9.21 .14 | 75.0 2.9 |
| July 7.9 | 40.87 .21 | 21.0 1.5 | 16.00 .20 | 29.4 2.3 | 55.80 .20 | 45.3 1.5 | 9.38 .19 | 72.1 2.8 |
| 17.9 | 41.10 .24 | 19.5 1.5 | 16.21 .23 | 27.1 2.2 | 56.02 .23 | 43.8 1.5 | 9.58 .22 | 69.4 2.7 |
| 27.9 | 41.34 .26 | 18.1 1.4 | 16.45 .25 | 25.1 2.0 | 56.26 .25 | 42.3 1.4 | 9.82 .25 | 66.8 2.5 |
| Aug. 6.8 | 41.61 .27 | 16.8 1.2 | 16.71 .27 | 23.2 1.7 | 56.52 .27 | 41.0 1.3 | 10.09 .28 | 64.5 2.1 |
| 16.8 | 41.89 .29 | 15.7 1.0 | 16.98 .28 | 21.6 1.4 | 56.80 .28 | 39.8 1.1 | 10.38 .30 | 62.6 1.7 |
| 26.8 | 42.18 .29 | 14.8 0.8 | 17.27 .29 | 20.4 1.0 | 57.09 .29 | 38.9 0.8 | 10.68 .31 | 61.1 1.2 |
| Sept. 5.8 | 42.47 .30 | 14.1 0.5 | 17.57 .30 | 19.6 0.6 | 57.38 .30 | 38.2 0.5 | 11.00 .32 | 60.1 0.7 |
| 15.7 | 42.77 .30 | 13.7 +0.2 | 17.87 .30 | 19.1 +0.2 | 57.68 .30 | 37.9 +0.2 | 11.33 .33 | 59.7 +0.2 |
| 25.7 | 43.07 .30 | 13.6 −0.1 | 18.17 .30 | 19.2 −0.3 | 57.98 .30 | 37.8 −0.1 | 11.66 .33 | 59.8 −0.4 |
| Oct. 5.7 | 43.36 .29 | 13.9 0.4 | 18.47 .29 | 19.7 0.7 | 58.27 .29 | 38.0 0.4 | 11.98 .32 | 60.5 1.0 |
| 15.7 | 43.64 .28 | 14.4 0.6 | 18.75 .28 | 20.6 1.1 | 58.55 .28 | 38.6 0.7 | 12.29 .30 | 61.7 1.5 |
| 25.6 | 43.91 .26 | 15.1 0.9 | 19.02 .26 | 22.0 1.5 | 58.82 .26 | 39.4 0.9 | 12.58 .28 | 63.4 2.0 |
| Nov. 4.6 | 44.16 .24 | 16.2 1.1 | 19.27 .24 | 23.7 1.9 | 59.08 .24 | 40.4 1.2 | 12.84 .25 | 65.6 2.4 |
| 14.6 | 44.39 .22 | 17.4 1.3 | 19.49 .21 | 25.6 2.1 | 59.31 .22 | 41.7 1.3 | 13.08 .22 | 68.1 2.7 |
| 24.5 | 44.59 .19 | 18.7 1.4 | 19.68 .18 | 27.8 2.3 | 59.52 .19 | 43.1 1.4 | 13.28 .18 | 70.9 2.9 |
| Dec. 4.5 | 44.76 .15 | 20.1 1.4 | 19.84 .14 | 30.1 2.3 | 59.69 .16 | 44.5 1.5 | 13.44 .14 | 73.9 3.0 |
| 14.5 | 44.90 .12 | 21.5 1.4 | 19.96 .10 | 32.5 2.3 | 59.83 .12 | 46.0 1.5 | 13.55 .09 | 76.9 3.0 |
| 24.5 | 44.99 .07 | 22.9 1.3 | 20.04 +.05 | 34.8 2.2 | 59.92 .07 | 47.4 1.4 | 13.62 +.04 | 79.9 3.0 |
| 34.4 | 45.04 +.03 | 24.2 −1.3 | 20.07 .00 | 36.8 −1.9 | 59.98 +.01 | 48.8 −1.3 | 13.63 −.02 | 82.8 −2.7 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Orionis. | | *22 Camelop. (H.) | | μ Geminorum. | | α Argus. (*Canopus.*) | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
| | h m<br>5 48 | +7° 23′ | h m<br>6 5 | +69° 21′ | h m<br>6 15 | +22° 34′ | h m<br>6 21 | −52° 37′ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.5 | 28.85 +.07 | 3.7 −0.9 | 14.33 +.15 | 45.8 +2.6 | 29.01 +.12 | 39.4 0.0 | 14.21 +.02 | 36.6 −3.5 |
| 10.5 | 28.90 +.03 | 2.8 0.8 | 14.42 +.03 | 48.4 2.6 | 29.09 .06 | 39.4 +0.1 | 14.19 −.06 | 40.0 3.3 |
| 20.4 | 28.91 −.02 | 2.1 0.7 | 14.38 −.10 | 50.9 2.4 | 29.13 +.01 | 39.5 0.1 | 14.10 .13 | 43.2 3.0 |
| 30.4 | 28.87 .06 | 1.5 0.5 | 14.22 .22 | 53.2 2.2 | 29.11 −.04 | 39.6 0.2 | 13.94 .19 | 46.0 2.7 |
| Feb. 9.4 | 28.79 .10 | 1.0 0.4 | 13.95 .33 | 55.3 1.9 | 29.05 .08 | 39.8 0.2 | 13.72 .25 | 48.5 2.3 |
| 19.3 | 28.67 .13 | 0.7 0.3 | 13.58 .41 | 57.0 1.5 | 28.95 .12 | 40.0 0.2 | 13.45 .29 | 50.6 1.8 |
| 29.3 | 28.53 .15 | 0.4 0.2 | 13.13 .47 | 58.2 1.0 | 28.81 .15 | 40.1 0.2 | 13.14 .33 | 52.1 1 3 |
| Mar. 10.3 | 28.37 .17 | 0.3 −0.1 | 12.63 .51 | 59.0 +0.5 | 28.65 .17 | 40.3 0.1 | 12.80 .35 | 53.2 0.8 |
| 20.3 | 28.20 .17 | 0.2 0.0 | 12.11 .52 | 59.3 0.0 | 28.47 .18 | 40.4 +0.1 | 12.45 .36 | 53.7 −0.3 |
| 30.2 | 28.04 .16 | 0.3 +0.1 | 11.60 .51 | 59.0 −0.5 | 28.30 .17 | 40.4 0.0 | 12.09 .35 | 53.7 +0.3 |
| Apr. 9.2 | 27.89 .14 | 0.4 0.2 | 11.11 .47 | 58.3 0.9 | 28.14 .16 | 40.4 −0.1 | 11.75 .34 | 53.2 0.8 |
| 19.2 | 27.76 .11 | 0.7 0.3 | 10.67 .40 | 57.2 1.4 | 27.99 .13 | 40.3 0.1 | 11.42 .31 | 52.2 1.2 |
| 29.2 | 27.67 .08 | 1.1 0.4 | 10.31 .32 | 55.6 1.7 | 27.88 .10 | 40.2 0.1 | 11.13 .27 | 50.7 1.7 |
| May 9.1 | 27.61 −.04 | 1.6 0.6 | 10.03 .23 | 53.7 2.0 | 27.80 .06 | 40.0 0.1 | 10.88 .22 | 48.8 2.1 |
| 19.1 | 27.59 .00 | 2.2 0.7 | 9.86 .12 | 51.6 2.3 | 27.76 −.02 | 39.9 0.1 | 10.68 .17 | 46.5 2.5 |
| 29.1 | 27.61 +.04 | 2.9 0.8 | 9.80 −.01 | 49.2 2.4 | 27.77 +.03 | 39.8 0.1 | 10.54 .12 | 43.8 2.8 |
| June 8.0 | 27.68 .09 | 3.8 0.9 | 9.84 +.11 | 46.8 2.5 | 27.82 .07 | 39.7 −0.1 | 10.45 −.06 | 40.9 3.0 |
| 18.0 | 27.78 .13 | 4.7 1.0 | 10.00 .21 | 44.3 2.5 | 27.91 .11 | 39.7 0.0 | 10.43 +.01 | 37.8 3.2 |
| 28.0 | 27.93 .16 | 5.6 1.0 | 10.27 .32 | 41.9 2.4 | 28.05 .15 | 39.7 0.0 | 10.46 .07 | 34.6 3.3 |
| July 8.0 | 28.11 .20 | 6.7 1.0 | 10.64 .42 | 39.5 2.3 | 28.22 .19 | 39.7 +0.1 | 10.56 .13 | 31.3 3.3 |
| 17.9 | 28.32 .22 | 7.7 1.0 | 11.10 .51 | 37.3 2.1 | 28.42 .22 | 39.8 0.1 | 10.71 .18 | 28.1 3.1 |
| 27.9 | 28.55 .25 | 8.7 1.0 | 11.64 .58 | 35.3 1.9 | 28.66 .25 | 39.9 0.1 | 10.92 .23 | 25.1 2.9 |
| Aug. 6.9 | 28.81 .27 | 9.6 0.9 | 12.26 .65 | 33.6 1.6 | 28.92 .27 | 40.0 0.1 | 11.18 .28 | 22.3 2.6 |
| 16.9 | 29.09 .28 | 10.5 0.8 | 12.93 .70 | 32.1 1.3 | 29.20 .29 | 40.1 +0.1 | 11.48 .32 | 19.9 2.2 |
| 26.8 | 29.38 .29 | 11.1 0.6 | 13.66 .75 | 30.9 1.0 | 29.50 .31 | 40.2 0.0 | 11.82 .36 | 17.9 1.7 |
| Sept. 5.8 | 29.67 .30 | 11.6 0.4 | 14.42 .78 | 30.1 0.7 | 29.82 .32 | 40.2 0.0 | 12.19 .39 | 16.4 1.2 |
| 15.8 | 29.98 .30 | 11.9 +0.2 | 15.21 .80 | 29.6 −0.3 | 30.14 .33 | 40.1 −0.1 | 12.59 .40 | 15.6 +0.6 |
| 25.7 | 30.28 .30 | 12.0 −0.1 | 16.01 .80 | 29.4 0.0 | 30.47 .33 | 40.0 0.2 | 13.00 .41 | 15.3 0.0 |
| Oct. 5.7 | 30.58 .30 | 11.8 0.3 | 16.81 .80 | 29.6 +0.4 | 30.80 .33 | 39.8 0.2 | 13.41 .41 | 15.6 −0.7 |
| 15.7 | 30.88 .29 | 11.4 0.5 | 17.60 .78 | 30.2 0.8 | 31.13 .33 | 39.5 0.3 | 13.82 .40 | 16.7 1.3 |
| 25.7 | 31.17 .28 | 10.8 0.7 | 18.37 .75 | 31.2 1.1 | 31.46 .32 | 39.2 0.3 | 14.21 .38 | 18.3 1.9 |
| Nov. 4.6 | 31.44 .27 | 10.0 0.9 | 19.09 .70 | 32.5 1.5 | 31.77 .31 | 38.8 0.4 | 14.58 .35 | 20.5 2.4 |
| 14.6 | 31.70 .24 | 9.1 1.0 | 19.76 .64 | 34.1 1.8 | 32.07 .29 | 38.5 0.4 | 14.90 .31 | 23.1 2.9 |
| 24.6 | 31.92 .22 | 8.1 1.0 | 20.36 .56 | 36.1 2.1 | 32.34 .26 | 38.2 0.3 | 15.19 .26 | 26.2 3.3 |
| Dec. 4.6 | 32.12 .18 | 7.1 1.0 | 20.87 .46 | 38.3 2.3 | 32.59 .23 | 37.9 0.3 | 15.41 .20 | 29.6 3.5 |
| 14.5 | 32.29 .14 | 6.1 1.0 | 21.27 .35 | 40.7 2.5 | 32.80 .19 | 37.6 0.2 | 15.58 .13 | 33.1 3.6 |
| 24.5 | 32.41 .10 | 5.1 1.0 | 21.56 .23 | 43.2 2.6 | 32.96 .14 | 37.5 −0.1 | 15.67 +.06 | 36.7 3.6 |
| 34.5 | 32.49 +.06 | 4.2 −0.9 | 21.73 +.11 | 45.8 +2.6 | 33.08 +.09 | 37.4 0.0 | 15.70 −.01 | 40.3 −3.5 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | γ Geminorum. | | α Canis Majoris. (*Sirius.*) | | ε Canis Majoris. | | δ Canis Majoris. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* |
| | $6^{h}\ 30^{m}$ | $+16^{\circ}\ 30'$ | $6^{h}\ 39^{m}$ | $-16^{\circ}\ 32'$ | $6^{h}\ 53^{m}$ | $-28^{\circ}\ 47'$ | $7^{h}\ 3^{m}$ | $-26^{\circ}\ 11'$ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.5 | 34.34 +.12 | 19.7 −0.5 | 42.30 +.10 | 45.0 −2.4 | 46.69 +.10 | 68.5 −3.0 | 22.44 +.12 | 41.6 −2.9 |
| 10.5 | 34.43 .07 | 19.3 0.3 | 42.37 +.05 | 47.4 2.3 | 46.76 +.05 | 71.4 2.8 | 22.53 .06 | 44.5 2.8 |
| 20.4 | 34.48 +.02 | 19.0 0.2 | 42.40 .00 | 49.5 2.1 | 46.79 .00 | 74.1 2.6 | 22.56 +.01 | 47.1 2.6 |
| 30.4 | 34.48 −.03 | 18.9 0.1 | 42.37 −.05 | 51.5 1.8 | 46.76 −.06 | 76.6 2.4 | 22.55 −.04 | 49.6 2.3 |
| Feb. 9.4 | 34.43 .07 | 18.8 −0.1 | 42.31 .09 | 53.2 1.5 | 46.68 .10 | 78.8 2.0 | 22.49 .09 | 51.8 2.0 |
| 19.4 | 34.34 .11 | 18.7 0.0 | 42.20 .13 | 54.5 1.2 | 46.55 .14 | 80.7 1.7 | 22.37 .13 | 53.6 1.7 |
| 29.4 | 34.21 .14 | 18.7 0.0 | 42.05 .16 | 55.6 0.9 | 46.39 .17 | 82.1 1.3 | 22.23 .16 | 55.1 1.3 |
| Mar. 10.3 | 34.06 .16 | 18.8 +0.1 | 41.89 .18 | 56.4 0.6 | 46.21 .20 | 83.2 0.9 | 22.05 .18 | 56.2 0.9 |
| 20.3 | 33.90 .17 | 18.9 0.1 | 41.71 .18 | 56.8 −0.3 | 46.00 .21 | 83.9 0.5 | 21.86 .20 | 56.9 0.5 |
| 30.3 | 33.73 .17 | 19.0 0.1 | 41.52 .18 | 56.9 +0.1 | 45.79 .21 | 84.1 −0.1 | 21.66 .21 | 57.2 −0.1 |
| Apr. 9.2 | 33.57 .15 | 19.0 0.1 | 41.34 .17 | 56.7 0.4 | 45.58 .20 | 84.0 +0.3 | 21.46 .20 | 57.1 +0.3 |
| 19.2 | 33.43 .13 | 19.1 0.1 | 41.18 .16 | 56.1 0.7 | 45.38 .19 | 83.5 0.7 | 21.27 .18 | 56.7 0.6 |
| 29.2 | 33.31 .10 | 19.2 0.1 | 41.03 .13 | 55.3 1.0 | 45.21 .16 | 82.5 1.1 | 21.10 .16 | 55.8 1.0 |
| May 9.2 | 33.22 .07 | 19.3 0.1 | 40.92 .10 | 54.2 1.2 | 45.06 .13 | 81.2 1.5 | 20.95 .13 | 54.7 1.3 |
| 19.1 | 33.17 −.03 | 19.5 0.2 | 40.84 .06 | 52.9 1.5 | 44.95 .10 | 79.6 1.8 | 20.84 .10 | 53.2 1.6 |
| 29.1 | 33.17 +.01 | 19.7 0.2 | 40.80 −.02 | 51.3 1.7 | 44.87 .06 | 77.7 2.0 | 20.76 .06 | 51.4 1.9 |
| June 8.1 | 33.20 .05 | 19.9 0.3 | 40.79 +.02 | 49.5 1.9 | 44.83 −.02 | 75.6 2.3 | 20.72 −.02 | 49.4 2.1 |
| 18.0 | 33.27 .10 | 20.2 0.3 | 40.83 .06 | 47.6 2.0 | 44.84 +.03 | 73.2 2.4 | 20.72 +.02 | 47.2 2.3 |
| 28.0 | 33.39 .13 | 20.5 0.3 | 40.91 .09 | 45.6 2.0 | 44.88 .07 | 70.7 2.5 | 20.76 .06 | 44.9 2.4 |
| July 8.0 | 33.54 .17 | 20.9 0.4 | 41.02 .13 | 43.5 2.0 | 44.97 .11 | 68.2 2.6 | 20.84 .10 | 42.4 2.4 |
| 18.0 | 33.72 .20 | 21.2 0.4 | 41.16 .16 | 41.5 2.0 | 45.09 .14 | 65.6 2.5 | 20.96 .14 | 40.0 2.4 |
| 27.9 | 33.93 .23 | 21.6 0.3 | 41.34 .19 | 39.6 1.9 | 45.26 .18 | 63.2 2.4 | 21.11 .17 | 37.7 2.3 |
| Aug. 6.9 | 34.17 .25 | 21.9 0.3 | 41.55 .22 | 37.8 1.7 | 45.45 .21 | 60.9 2.2 | 21.30 .20 | 35.5 2.1 |
| 16.9 | 34.44 .27 | 22.1 0.2 | 41.78 .24 | 36.2 1.4 | 45.67 .24 | 58.9 1.9 | 21.51 .23 | 33.5 1.8 |
| 26.8 | 34.72 .29 | 22.3 +0.1 | 42.03 .26 | 34.9 1.1 | 45.92 .26 | 57.2 1.5 | 21.75 .25 | 31.9 1.5 |
| Sept. 5.8 | 35.01 .30 | 22.4 0.0 | 42.30 .28 | 34.0 0.7 | 46.20 .29 | 55.9 1.1 | 22.02 .28 | 30.6 1.1 |
| 15.8 | 35.32 .31 | 22.3 −0.1 | 42.58 .29 | 33.5 +0.3 | 46.49 .30 | 55.0 0.6 | 22.30 .29 | 29.8 0.6 |
| 25.8 | 35.63 .32 | 22.1 0.3 | 42.88 .30 | 33.4 −0.1 | 46.80 .31 | 54.7 +0.1 | 22.60 .31 | 29.4 +0.1 |
| Oct. 5.7 | 35.95 .32 | 21.8 0.4 | 43.18 .30 | 33.8 0.6 | 47.12 .32 | 54.9 −0.5 | 22.92 .32 | 29.6 −0.4 |
| 15.7 | 36.27 .32 | 21.4 0.5 | 43.48 .30 | 34.6 1.0 | 47.44 .32 | 55.6 1.0 | 23.23 .32 | 30.3 1.0 |
| 25.7 | 36.59 .32 | 20.8 0.6 | 43.79 .30 | 35.8 1.4 | 47.76 .32 | 56.9 1.5 | 23.55 .32 | 31.5 1.4 |
| Nov. 4.7 | 36.90 .31 | 20.1 0.7 | 44.08 .29 | 37.4 1.8 | 48.07 .31 | 58.6 2.0 | 23.86 .31 | 33.2 1.9 |
| 14.6 | 37.20 .29 | 19.4 0.7 | 44.35 .27 | 39.3 2.1 | 48.37 .28 | 60.8 2.4 | 24.16 .29 | 35.2 2.3 |
| 24.6 | 37.47 .26 | 18.7 0.7 | 44.61 .24 | 41.5 2.3 | 48.64 .26 | 63.3 2.7 | 24.44 .26 | 37.7 2.6 |
| Dec. 4.6 | 37.72 .23 | 18.0 0.7 | 44.84 .21 | 43.9 2.5 | 48.88 .22 | 66.1 2.9 | 24.69 .23 | 40.4 2.8 |
| 14.6 | 37.93 .19 | 17.3 0.6 | 45.03 .17 | 46.4 2.5 | 49.08 .18 | 69.1 3.0 | 24.90 .19 | 43.2 2.9 |
| 24.5 | 38.11 .15 | 16.7 0.6 | 45.18 .13 | 48.9 2.5 | 49.24 .14 | 72.1 3.0 | 25.07 .15 | 46.2 3.0 |
| 34.5 | 38.23 +.11 | 16.2 −0.4 | 45.28 +.08 | 51.4 −2.4 | 49.35 +.08 | 75.1 −3.0 | 25.19 +.10 | 49.1 −2.9 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | δ Geminorum. | | * Piazzi vii. 67. | | α Geminorum. (*Castor.*) | | α Canis Minoris. (*Procyon.*) | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>7 12 | +22° 12′ | h m<br>7 17 | +68° 42′ | h m<br>7 26 | +32° 9′ | h m<br>7 32 | +5° 32′ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.5 | 44.51 +.18 | 38.0 −0.3 | 61.85 +.34 | 59.3 +2.4 | 42.54 +.20 | 34.9 +0.4 | 50.02 +.17 | 34.0 −1.4 |
| 10.5 | 44.66 .12 | 37.9 −0.1 | 62.13 .22 | 61.7 2.5 | 42.72 .15 | 35.3 0.5 | 50.17 .13 | 32.7 1.2 |
| 20.5 | 44.75 .07 | 37.8 +0.1 | 62.28 +.09 | 64.3 2.6 | 42.84 .09 | 35.9 0.6 | 50.27 .08 | 31.6 1.1 |
| 30.4 | 44.79 +.01 | 37.9 0.2 | 62.31 −.04 | 66.8 2.5 | 42.89 +.03 | 36.6 0.7 | 50.32 +.02 | 30.6 0.9 |
| Feb. 9.4 | 44.78 −.04 | 38.1 0.2 | 62.20 .16 | 69.3 2.4 | 42.90 −.03 | 37.3 0.8 | 50.32 −.03 | 29.9 0.7 |
| 19.4 | 44.72 .08 | 38.4 0.3 | 61.99 .27 | 71.5 2.1 | 42.84 .08 | 38.1 0.8 | 50.27 .07 | 29.3 0.5 |
| 29.4 | 44.62 .12 | 38.7 0.3 | 61.67 .36 | 73.4 1.8 | 42.74 .12 | 38.9 0.7 | 50.18 .11 | 28.8 0.3 |
| Mar. 10.3 | 44.48 .15 | 39.1 0.3 | 61.27 .43 | 75.0 1.4 | 42.61 .15 | 39.6 0.7 | 50.06 .13 | 28.6 0.2 |
| 20.3 | 44.32 .16 | 39.4 0.3 | 60.82 .48 | 76.2 0.9 | 42.44 .18 | 40.2 0.5 | 49.92 .15 | 28.5 −0.1 |
| 30.3 | 44.16 .17 | 39.6 0.2 | 60.33 .50 | 76.8 +0.4 | 42.26 .19 | 40.6 0.4 | 49.77 .16 | 28.5 +0.1 |
| Apr. 9.3 | 43.99 .16 | 39.8 0.2 | 59.83 .49 | 77.0 −0.1 | 42.07 .18 | 40.9 +0.2 | 49.61 .16 | 28.6 0.2 |
| 19.2 | 43.83 .15 | 39.9 +0.1 | 59.35 .46 | 76.7 0.6 | 41.89 .17 | 41.0 0.0 | 49.45 .15 | 28.8 0.3 |
| 29.2 | 43.69 .13 | 40.0 0.0 | 58.91 .41 | 75.9 1.0 | 41.74 .15 | 40.9 −0.1 | 49.32 .13 | 29.1 0.4 |
| May 9.2 | 43.58 .10 | 40.0 0.0 | 58.53 .35 | 74.7 1.4 | 41.60 .12 | 40.7 0.3 | 49.21 .10 | 29.5 0.5 |
| 19.1 | 43.50 .06 | 40.0 0.0 | 58.23 .26 | 73.1 1.8 | 41.50 .08 | 40.4 0.4 | 49.12 .07 | 30.0 0.5 |
| 29.1 | 43.46 −.02 | 39.9 −0.1 | 58.01 .17 | 71.2 2.1 | 41.44 −.04 | 39.9 0.5 | 49.06 −.04 | 30.6 0.6 |
| June 8.1 | 43.46 +.02 | 39.8 0.1 | 57.88 −.07 | 69.0 2.3 | 41.42 .00 | 39.4 0.6 | 49.04 .00 | 31.3 0.7 |
| 18.1 | 43.50 .06 | 39.7 0.1 | 57.86 +.03 | 66.5 2.5 | 41.45 +.05 | 38.7 0.7 | 49.05 +.03 | 32.0 0.7 |
| 28.0 | 43.58 .10 | 39.6 0.1 | 57.94 .13 | 64.0 2.6 | 41.51 .09 | 38.0 0.7 | 49.10 .07 | 32.7 0.8 |
| July 8.0 | 43.69 .13 | 39.5 0.1 | 58.11 .22 | 61.4 2.6 | 41.62 .13 | 37.3 0.8 | 49.18 .10 | 33.5 0.7 |
| 18.0 | 43.84 .17 | 39.3 0.2 | 58.38 .32 | 58.8 2.6 | 41.77 .16 | 36.5 0.8 | 49.30 .13 | 34.2 0.7 |
| 28.0 | 44.02 .20 | 39.2 0.2 | 58.75 .41 | 56.2 2.5 | 41.95 .20 | 35.7 0.8 | 49.44 .16 | 34.9 0.7 |
| Aug. 6.9 | 44.24 .23 | 39.0 0.2 | 59.19 .49 | 53.8 2.4 | 42.16 .23 | 34.9 0.8 | 49.61 .19 | 35.5 0.6 |
| 16.9 | 44.48 .25 | 38.7 0.3 | 59.71 .56 | 51.5 2.2 | 42.41 .26 | 34.1 0.8 | 49.81 .21 | 36.0 0.4 |
| 26.9 | 44.74 .27 | 38.4 0.3 | 60.30 .62 | 49.4 2.0 | 42.68 .28 | 33.2 0.8 | 50.04 .23 | 36.3 +0.2 |
| Sept. 5.8 | 45.02 .29 | 38.1 0.4 | 60.94 .67 | 47.5 1.7 | 42.97 .31 | 32.4 0.9 | 50.28 .25 | 36.5 0.0 |
| 15.8 | 45.32 .31 | 37.6 0.5 | 61.64 .72 | 45.9 1.4 | 43.29 .33 | 31.5 0.9 | 50.54 .27 | 36.4 −0.2 |
| 25.8 | 45.63 .32 | 37.0 0.6 | 62.37 .75 | 44.7 1.1 | 43.63 .34 | 30.7 0.9 | 50.82 .29 | 36.1 0.5 |
| Oct. 5.8 | 45.96 .33 | 36.4 0.7 | 63.14 .77 | 43.7 0.8 | 43.98 .36 | 29.8 0.8 | 51.12 .30 | 35.5 0.7 |
| 15.7 | 46.29 .34 | 35.7 0.7 | 63.92 .79 | 43.1 −0.4 | 44.34 .37 | 29.0 0.8 | 51.42 .31 | 34.7 0.9 |
| 25.7 | 46.63 .34 | 34.9 0.8 | 64.70 .78 | 42.9 0.0 | 44.71 .37 | 28.2 0.8 | 51.74 .32 | 33.6 1.1 |
| Nov. 4.7 | 46.97 .33 | 34.2 0.9 | 65.48 .77 | 43.1 +0.4 | 45.08 .37 | 27.5 0.6 | 52.05 .32 | 32.4 1.3 |
| 14.7 | 47.30 .32 | 33.4 0.8 | 66.23 .73 | 43.8 0.8 | 45.44 .36 | 26.9 0.5 | 52.36 .31 | 31.0 1.5 |
| 24.6 | 47.61 .31 | 32.6 0.7 | 66.94 .68 | 44.8 1.2 | 45.79 .34 | 26.5 0.4 | 52.66 .29 | 29.5 1.5 |
| Dec. 4.6 | 47.91 .28 | 32.0 0.6 | 67.58 .61 | 46.2 1.6 | 46.12 .31 | 26.2 −0.2 | 52.94 .27 | 27.9 1.6 |
| 14.6 | 48.17 .24 | 31.4 0.5 | 68.14 .52 | 48.0 1.9 | 46.41 .28 | 26.1 0.0 | 53.19 .24 | 26.3 1.5 |
| 24.5 | 48.39 .20 | 31.0 0.4 | 68.61 .41 | 50.0 2.2 | 46.67 .23 | 26.2 +0.2 | 53.41 .20 | 24.8 1.5 |
| 34.5 | 48.56 +.15 | 30.7 −0.2 | 68.95 +.28 | 52.3 +2.4 | 46.88 +.18 | 26.4 +0.3 | 53.59 +.15 | 23.4 −1.4 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | β Geminorum. (*Pollux.*) | | φ Geminorum. | | *3 Ursæ Majoris (H.) | | 15 Argus (ι) | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
| | h m<br>7 37 | ° ′<br>+28 19 | h m<br>7 45 | ° ′<br>+27 4 | h m<br>8 0 | ° ′<br>+68 49 | h m<br>8 2 | ° ′<br>−23 56 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.5 | 45.18 +.20 | 30.8 0.0 | 56.01 +.21 | 69.9 −0.1 | 31.24 +.44 | 69.9 +2.1 | 17.12 +.18 | 42.8 −2.9 |
| 10.5 | 45.35 .15 | 30.9 +0.2 | 56.20 .16 | 69.9 +0.1 | 31.63 .33 | 72.1 2.4 | 17.27 .13 | 45.7 2.9 |
| 20.5 | 45.48 .10 | 31.2 0.4 | 56.34 .10 | 70.1 0.3 | 31.90 .20 | 74.5 2.5 | 17.37 .08 | 48.5 2.7 |
| 30.5 | 45.55 +.04 | 31.6 0.5 | 56.41 +.05 | 70.5 0.4 | 32.03 +.07 | 77.1 2.6 | 17.43 +.03 | 51.1 2.5 |
| Feb. 9.4 | 45.56 −.02 | 32.2 0.6 | 56.43 −.01 | 70.9 0.5 | 32.03 −.06 | 79.7 2.5 | 17.43 −.03 | 53.5 2.3 |
| 19.4 | 45.51 .07 | 32.8 0.6 | 56.40 .06 | 71.5 0.6 | 31.91 .18 | 82.1 2.4 | 17.37 .07 | 55.6 2.0 |
| 29.4 | 45.42 .11 | 33.4 0.6 | 56.32 .10 | 72.1 0.6 | 31.68 .29 | 84.4 2.1 | 17.28 .11 | 57.4 1.6 |
| Mar. 10.3 | 45.29 .14 | 34.0 0.6 | 56.20 .13 | 72.7 0.6 | 31.35 .37 | 86.4 1.8 | 17.15 .14 | 58.8 1.3 |
| 20.3 | 45.14 .16 | 34.6 0.5 | 56.05 .16 | 73.2 0.5 | 30.94 .44 | 88.0 1.4 | 16.99 .17 | 60.0 0.9 |
| 30.3 | 44.97 .18 | 35.0 0.4 | 55.89 .17 | 73.7 0.4 | 30.49 .48 | 89.2 0.9 | 16.82 .18 | 60.7 0.5 |
| Apr. 9.3 | 44.79 .18 | 35.4 0.3 | 55.71 .17 | 74.1 0.3 | 30.00 .49 | 89.9 +0.5 | 16.64 .18 | 61.0 −0.2 |
| 19.2 | 44.62 .16 | 35.6 +0.1 | 55.55 .16 | 74.3 0.2 | 29.51 .49 | 90.1 0.0 | 16.45 .18 | 61.1 +0.2 |
| 29.2 | 44.47 .14 | 35.7 0.0 | 55.39 .14 | 74.5 +0.1 | 29.04 .45 | 89.8 −0.5 | 16.28 .17 | 60.7 0.5 |
| May 9.2 | 44.34 .12 | 35.6 −0.1 | 55.26 .12 | 74.5 −0.1 | 28.61 .40 | 89.0 1.0 | 16.13 .15 | 60.0 0.9 |
| 19.2 | 44.24 .08 | 35.4 0.2 | 55.16 .09 | 74.4 0.2 | 28.23 .34 | 87.8 1.4 | 15.99 .12 | 59.0 1.2 |
| 29.1 | 44.17 .05 | 35.2 0.3 | 55.09 .05 | 74.2 0.3 | 27.93 .26 | 86.2 1.8 | 15.88 .09 | 57.7 1.4 |
| June 8.1 | 44.15 −.01 | 34.8 0.4 | 55.07 −.01 | 73.9 0.3 | 27.72 .17 | 84.3 2.1 | 15.81 .06 | 56.1 1.7 |
| 18.1 | 44.16 +.04 | 34.4 0.5 | 55.08 +.03 | 73.5 0.4 | 27.59 −.08 | 82.0 2.4 | 15.77 −.03 | 54.3 1.9 |
| 28.0 | 44.22 .08 | 33.9 0.5 | 55.12 .07 | 73.1 0.5 | 27.56 +.02 | 79.5 2.6 | 15.76 +.01 | 52.4 2.0 |
| July 8.0 | 44.31 .11 | 33.3 0.6 | 55.21 .10 | 72.6 0.5 | 27.62 .11 | 76.9 2.7 | 15.78 .04 | 50.3 2.1 |
| 18.0 | 44.44 .15 | 32.7 0.6 | 55.33 .14 | 72.0 0.6 | 27.78 .21 | 74.2 2.8 | 15.85 .08 | 48.2 2.2 |
| 28.0 | 44.60 .18 | 32.1 0.6 | 55.48 .17 | 71.5 0.6 | 28.04 .30 | 71.4 2.8 | 15.94 .11 | 46.0 2.1 |
| Aug. 6.9 | 44.80 .21 | 31.4 0.7 | 55.67 .20 | 70.8 0.7 | 28 37 .38 | 68.7 2.7 | 16.07 .15 | 44.0 2.0 |
| 16.9 | 45.03 .24 | 30.7 0.7 | 55.89 .23 | 70.1 0.7 | 28.79 .46 | 66.0 2.6 | 16.23 .18 | 42.1 1.8 |
| 26.9 | 45.28 .27 | 30.0 0.8 | 56.13 .26 | 69.4 0.8 | 29.29 .53 | 63.4 2.5 | 16.42 .21 | 40.4 1.5 |
| Sept. 5.9 | 45.56 .29 | 29.2 0.8 | 56.40 .28 | 68.6 0.8 | 29.85 .60 | 61.1 2.3 | 16.64 .24 | 39.1 1.2 |
| 15.8 | 45.85 .31 | 28.4 0.9 | 56.69 .30 | 67.8 0.9 | 30.46 .66 | 58.9 2.0 | 16.89 .26 | 38.1 0.8 |
| 25.8 | 46.17 .33 | 27.5 0.9 | 57.00 .32 | 66.9 0.9 | 31.16 .71 | 57.0 1.8 | 17.16 .28 | 37.6 +0.3 |
| Oct. 5.8 | 46.50 .34 | 26.6 0.9 | 57.33 .34 | 65.9 1.0 | 31.89 .74 | 55.4 1.4 | 17.46 .30 | 37.5 −0.2 |
| 15.7 | 46.85 .35 | 25.7 0.9 | 57.67 .35 | 64.9 1.0 | 32.65 .77 | 54.2 1.1 | 17.77 .32 | 37.9 0.7 |
| 25.7 | 47.21 .36 | 24.8 0.9 | 58.02 .36 | 63.9 1.0 | 33.43 .79 | 53.3 0.7 | 18.09 .33 | 38.8 1.2 |
| Nov. 4.7 | 47.56 .36 | 23.9 0.8 | 58.38 .36 | 63.0 0.9 | 34.22 .79 | 52.9 −0.2 | 18.42 .33 | 40.2 1.6 |
| 14.7 | 47.92 .35 | 23.1 0.8 | 58.74 .35 | 62.1 0.9 | 35.00 .77 | 52.9 +0.2 | 18.74 .32 | 42.1 2.0 |
| 24.6 | 48.26 .34 | 22.4 0.6 | 59.08 .34 | 61.3 0.8 | 35.75 .73 | 53.3 0.6 | 19.05 .31 | 44.3 2.4 |
| Dec. 4.6 | 48.58 .31 | 21.8 0.5 | 59.40 .31 | 60.6 0.6 | 36.46 .68 | 54.1 1.1 | 19.35 .28 | 46.8 2.7 |
| 14.6 | 48.88 .28 | 21.5 0.3 | 59.70 .28 | 60.1 0.4 | 37.10 .60 | 55.4 1.5 | 19.61 .25 | 49.6 2.8 |
| 24.6 | 49.13 .23 | 21.3 −0.1 | 59.96 .24 | 59.8 −0.2 | 37.66 .51 | 57.1 1.9 | 19.84 .21 | 52.5 2.9 |
| 34.5 | 49.34 +.19 | 21.3 +0.1 | 60.18 +.19 | 59.6 0.0 | 38.12 +.40 | 59.2 +2.2 | 20.03 +.16 | 55.4 −2.9 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ε Hydræ. | | ι Ursæ Majoris. | | *σ² Ursæ Majoris. | | κ Cancri. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>8 40 | ° ′<br>+6 52 | h m<br>8 50 | ° ′<br>+48 31 | h m<br>8 59 | ° ′<br>+67 37 | h m<br>9 1 | ° ′<br>+11 9 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.6 | 13.76 +.23 | 25.9 −1.5 | 44.68 +.35 | 33.6 +0.7 | 31.27 +.54 | 61.9 +1.6 | 2.94 +.26 | 61.0 −1.3 |
| 10.6 | 13.97 .19 | 24.4 1.4 | 45.00 .28 | 34.5 1.1 | 31.76 .45 | 63.6 1.9 | 3.18 .21 | 59.8 1.2 |
| 20.5 | 14.14 .14 | 23.2 1.2 | 45.25 .21 | 35.7 1.3 | 32.15 .33 | 65.7 2.2 | 3.37 .17 | 58.7 1.0 |
| 30.5 | 14.25 .09 | 22.1 0.9 | 45.42 .14 | 37.1 1.6 | 32.43 .21 | 68.0 2.4 | 3.51 .12 | 57.8 0.7 |
| Feb. 9.5 | 14.32 +.04 | 21.3 0.7 | 45.53 +.07 | 38.8 1.7 | 32.58 +.09 | 70.5 2.6 | 3.60 .06 | 57.2 0.5 |
| 19.4 | 14.34 −.01 | 20.7 0.5 | 45.56 −.01 | 40.5 1.8 | 32.61 −.03 | 73.1 2.6 | 3.63 +.01 | 56.9 0.3 |
| 29.4 | 14.31 .05 | 20.3 0.3 | 45.52 .07 | 42.3 1.8 | 32.52 .15 | 75.7 2.5 | 3.62 −.03 | 56.7 −0.1 |
| Mar. 10.4 | 14.24 .09 | 20.0 −0.2 | 45.41 .13 | 44.0 1.7 | 32.32 .25 | 78.0 2.3 | 3.57 .07 | 56.7 +0.1 |
| 20.4 | 14.13 .12 | 20.0 0.0 | 45.26 .18 | 45.6 1.5 | 32.03 .33 | 80.2 2.0 | 3.49 .10 | 56.8 0.2 |
| 30.3 | 14.01 .13 | 20.0 +0.1 | 45.07 .21 | 46.9 1.2 | 31.67 .39 | 82.0 1.6 | 3.38 .12 | 57.0 0.3 |
| Apr. 9.3 | 13.87 .14 | 20.2 0.2 | 44.85 .23 | 48.0 0.9 | 31.26 .43 | 83.3 1.2 | 3.25 .14 | 57.3 0.3 |
| 19.3 | 13.73 .14 | 20.5 0.3 | 44.62 .23 | 48.8 0.6 | 30.82 .45 | 84.2 0.7 | 3.11 .14 | 57.7 0.4 |
| 29.3 | 13.59 .13 | 20.9 0.4 | 44.39 .23 | 49.2 +0.3 | 30.37 .45 | 84.7 +0.2 | 2.97 .13 | 58.1 0.4 |
| May 9.2 | 13.47 .12 | 21.3 0.4 | 44.17 .21 | 49.3 −0.1 | 29.93 .43 | 84.6 −0.3 | 2.85 .12 | 58.5 0.4 |
| 19.2 | 13.36 .10 | 21.7 0.5 | 43.98 .18 | 49.1 0.4 | 29.52 .39 | 84.1 0.8 | 2.73 .11 | 58.9 0.4 |
| 29.2 | 13.27 .07 | 22.2 0.5 | 43.81 .15 | 48.5 0.7 | 29.16 .33 | 83.1 1.2 | 2.64 .08 | 59.4 0.4 |
| June 8.1 | 13.21 .05 | 22.8 0.5 | 43.68 .11 | 47.6 1.0 | 28.86 .27 | 81.6 1.6 | 2 56 .06 | 59.8 0.4 |
| 18.1 | 13.18 −.02 | 23.3 0.6 | 43.60 .06 | 46.5 1.3 | 28.62 .20 | 79.8 2.0 | 2.52 −.03 | 60.1 0.4 |
| 28.1 | 13.17 +.01 | 23.9 0.6 | 43.56 −.02 | 45.1 1.5 | 28.46 .12 | 77.7 2.3 | 2.50 .00 | 60.5 0.3 |
| July 8.1 | 13.19 .04 | 24.4 0.5 | 43.56 +.03 | 43.4 1.7 | 28.38 −.04 | 75.2 2.6 | 2.51 +.02 | 60.8 0.3 |
| 18.0 | 13.25 .07 | 24.9 0.5 | 43.61 .07 | 41.6 1.9 | 28.39 +.05 | 72.6 2.8 | 2.55 .05 | 61.0 0.2 |
| 28.0 | 13.33 .10 | 25.4 0.4 | 43.71 .12 | 39.7 2.0 | 28.47 .13 | 69.7 2.9 | 2.62 .08 | 61.2 +0.1 |
| Aug. 7.0 | 13.44 .13 | 25.7 0.3 | 43.85 .16 | 37.6 2.1 | 28.64 .21 | 66.8 3.0 | 2.71 .11 | 61.2 0.0 |
| 17.0 | 13.58 .15 | 26.0 +0.2 | 44.03 .21 | 35.5 2.2 | 28.89 .29 | 63.8 3.0 | 2.83 .14 | 61.2 −0.1 |
| 26.9 | 13.75 .18 | 26.0 0.0 | 44.26 .25 | 33.3 2.2 | 29.22 .37 | 60.8 2.9 | 2.98 .17 | 60.9 0.3 |
| Sept. 5.9 | 13.95 .21 | 25.9 −0.2 | 44.52 .29 | 31.1 2.2 | 29.63 .44 | 57.9 2.9 | 3.16 .19 | 60.5 0.5 |
| 15.9 | 14.17 .23 | 25.6 0.4 | 44.88 .33 | 29.0 2.1 | 30.10 .51 | 55.1 2.7 | 3.37 .22 | 60.0 0.7 |
| 25.8 | 14.41 .26 | 25.1 0.7 | 45.17 .36 | 26.9 2.1 | 30.64 .57 | 52.5 2.5 | 3.61 .25 | 59.2 0.9 |
| Oct. 5.8 | 14.68 .28 | 24.3 0.9 | 45.55 .39 | 24.9 1.9 | 31.24 .63 | 50.1 2.3 | 3.87 .27 | 58.2 1.1 |
| 15.8 | 14.97 .30 | 23.3 1.1 | 45.96 .42 | 23.0 1.8 | 31.89 .68 | 48.0 2.0 | 4.15 .30 | 57.0 1.3 |
| 25 8 | 15.28 .32 | 22.1 1.3 | 46.39 .45 | 21.4 1.6 | 32.59 .71 | 46.2 1.6 | 4.46 .32 | 55.7 1.5 |
| Nov. 4.7 | 15.60 .33 | 20.7 1.5 | 46.84 .46 | 19.9 1.3 | 33.32 .74 | 44.9 1.2 | 4.78 .33 | 54.1 1.6 |
| 14.7 | 15.93 .33 | 19.1 1.7 | 47.31 .47 | 18.8 1.0 | 34.06 .75 | 43.9 0.7 | 5.11 .34 | 52.5 1.7 |
| 24.7 | 16.25 .32 | 17.4 1.7 | 47.77 .46 | 17.9 0.7 | 34.80 .74 | 43.5 −0.2 | 5.45 .34 | 50.8 1.7 |
| Dec. 4.7 | 16.57 .31 | 15.6 1.8 | 48.23 .44 | 17.5 −0.3 | 35.53 .71 | 43.5 +0.3 | 5.78 .33 | 49.1 1.7 |
| 14.6 | 16.87 .29 | 13.9 1.7 | 48.66 .42 | 17.4 +0.1 | 36.22 .66 | 44.0 0.8 | 6.10 .31 | 47.4 1.6 |
| 24.6 | 17.15 .26 | 12.2 1.6 | 49.05 .37 | 17.6 0.5 | 36.85 .59 | 45.0 1.2 | 6.39 .28 | 45.9 1.5 |
| 34.6 | 17.39 +.22 | 10.7 −1.5 | 49.40 +.32 | 18.3 +0.8 | 37.40 +.50 | 46.4 +1.7 | 6.65 +.23 | 44.5 −1.3 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON

| Mean Solar Date. | *ι* Argus. | | *1 Draconis (H.) | | *α* Hydræ. | | **d* Ursæ Majoris. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* |
| | h m<br>9 13 | ° ′<br>-58 45 | h m<br>9 19 | ° ′<br>+81 51 | h m<br>9 21 | ° ′<br>-8 7 | h m<br>9 23 | ° ′<br>+70 21 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.6 | 47.47 +.32 | 0.6 −3.5 | 25.35+1.37 | 71.0 +1.8 | 30.60 +.26 | 12.8 −2.3 | 33.19 +.65 | 76.4 +1.4 |
| 10.6 | 47.75 .24 | 4.2 3.8 | 26.60 1.13 | 73.1 2.3 | 30.84 .22 | 15.1 2.3 | 33.79 .55 | 78.1 1.8 |
| 20.6 | 47.95 .16 | 8.0 3.9 | 27.60 .86 | 75.5 2.6 | 31.03 .17 | 17.3 2.1 | 34.27 .43 | 80.1 2.2 |
| 30.5 | 48.07 +.08 | 11.9 3.9 | 28.30 .55 | 78.3 2.9 | 31.18 .12 | 19.3 1.9 | 34.63 .29 | 82.4 2.5 |
| Feb. 9.5 | 48.10 −.01 | 15.7 3.7 | 28.70+ .24 | 81.2 3.0 | 31.28 .07 | 21.1 1.7 | 34.86 .16 | 85.0 2.7 |
| 19.5 | 48.06 .09 | 19.3 3.5 | 28.78− .08 | 84.2 3 0 | 31.32 +.02 | 22.7 1.5 | 34.95 +.02 | 87.7 2.7 |
| 29.4 | 47.93 .16 | 22.7 3.3 | 28.55 .38 | 87.2 2.9 | 31.33 −.02 | 24.1 1.2 | 34.90 −.11 | 90.4 2.7 |
| Mar. 10.4 | 47.74 .22 | 25.9 3.0 | 28.03 .66 | 89.9 2.6 | 31.29 .06 | 25.1 1.0 | 34.73 .23 | 92.9 2.5 |
| 20.4 | 47.50 .27 | 28.6 2.6 | 27.25 .89 | 92.4 2.3 | 31.21 .09 | 26.0 0.7 | 34.44 .33 | 95.3 2.2 |
| 30.4 | 47.21 .31 | 31.0 2.1 | 26.26 1.08 | 94.5 1.9 | 31.11 .11 | 26.5 0.5 | 34.07 .41 | 97.3 1.9 |
| Apr. 9.3 | 46.88 .34 | 32.8 1.6 | 25.10 1.22 | 96.2 1.4 | 30.99 .13 | 26.9 −0.2 | 33.63 .47 | 99.0 1.4 |
| 19.3 | 46.54 .36 | 34.2 1.1 | 23.83 1.31 | 97.3 0.8 | 30.85 .13 | 27.0 0.0 | 33.14 .50 | 100.2 1.0 |
| 29.3 | 46.18 .36 | 35.1 0.6 | 22.49 1.34 | 97.8 +0.3 | 30.72 .13 | 26.9 +0.2 | 32.62 .52 | 100.9 +0.5 |
| May 9.3 | 45.82 .36 | 35.5 −0.1 | 21.16 1.32 | 97.8 −0.3 | 30.59 .13 | 26.6 0.4 | 32.11 .50 | 101.1 −0.1 |
| 19.2 | 45.47 .34 | 35.3 +0.4 | 19.87 1.25 | 97.2 0.9 | 30.47 .11 | 26.1 0.6 | 31.62 .47 | 100.8 0.6 |
| 29.2 | 45.14 .32 | 34.7 0.9 | 18.66 1.14 | 96.1 1.4 | 30.36 .10 | 25.4 0.7 | 31.17 .43 | 100.0 1.0 |
| June 8.2 | 44.84 .29 | 33.6 1.4 | 17.59 1.00 | 94.5 1.9 | 30.28 .08 | 24.6 0.9 | 30.77 .36 | 98.7 1.5 |
| 18.1 | 44.57 .25 | 32.0 1.8 | 16.68 .82 | 92.3 2.3 | 30.21 .05 | 23.7 1.0 | 30.44 .29 | 97.0 1.9 |
| 28.1 | 44.35 .20 | 30.0 2.2 | 15.96 .62 | 89.9 2.7 | 30.17 −.03 | 22.6 1.1 | 30.19 .21 | 94.9 2.3 |
| July 8.1 | 44.17 .15 | 27.6 2.5 | 15.45 .41 | 87.0 3.0 | 30.15 .00 | 21.5 1.1 | 30.03 .12 | 92.5 2.6 |
| 18.1 | 44.05 .09 | 25.0 2.7 | 15.15− .18 | 83.9 3.2 | 30.16 +.02 | 20.3 1.2 | 29.95 −.03 | 89.8 2.8 |
| 28.0 | 43.98 −.03 | 22.2 2.9 | 15.09+ .05 | 80.7 3.4 | 30.20 .05 | 19.2 1.2 | 29.96 +.06 | 86.9 3.0 |
| Aug. 7.0 | 43.98 +.03 | 19.3 3.0 | 15.25 .28 | 77.2 3.5 | 30.26 .08 | 18.1 1.1 | 30.07 .15 | 83.8 3.1 |
| 17.0 | 44.05 .10 | 16.3 2.9 | 15.65 .51 | 73.8 3.5 | 30.35 .11 | 17.1 0.9 | 30.27 .24 | 80.7 3.2 |
| 27.0 | 44.18 .16 | 13.4 2.8 | 16.27 .73 | 70.3 3.4 | 30.47 .14 | 16.3 0.7 | 30.56 .33 | 77.5 3.2 |
| Sept. 5.9 | 44.37 .23 | 10.8 2.5 | 17.10 .94 | 66.9 3.3 | 30.62 .17 | 15.6 0.5 | 30.94 .42 | 74.3 3.1 |
| 15.9 | 44.64 .30 | 8.4 2.2 | 18.15 1.14 | 63.7 3.1 | 30.81 .20 | 15.3 +0.2 | 31.40 .50 | 71.3 3.0 |
| 25.9 | 44.96 .36 | 6.5 1.7 | 19.38 1.32 | 60.7 2.9 | 31.02 .22 | 15.2 −0.1 | 31.94 .58 | 68.3 2.8 |
| Oct. 5.8 | 45.35 .41 | 5.0 1.2 | 20.78 1.48 | 58.0 2.6 | 31.25 .25 | 15.5 0.4 | 32.56 .65 | 65.6 2.6 |
| 15.8 | 45.78 .45 | 4.1 +0.6 | 22.33 1.62 | 55.6 2.2 | 31.52 .28 | 16.1 0.8 | 33.24 .72 | 63.2 2.3 |
| 25.8 | 46.25 .48 | 3.9 −0.1 | 24.01 1.73 | 53.6 1.8 | 31.81 .30 | 17.1 1.2 | 33.99 .77 | 61.1 1.9 |
| Nov. 4.8 | 46.74 .50 | 4.3 0.7 | 25.77 1.80 | 52.1 1.3 | 32.12 .32 | 18.4 1.5 | 34.77 .80 | 59.4 1.5 |
| 14.7 | 47.25 .51 | 5.3 1.4 | 27.59 1.83 | 51.1 0.7 | 32.45 .33 | 20.0 1.8 | 35.59 .83 | 58.2 1.0 |
| 24.7 | 47.75 .49 | 7.0 2.0 | 29.42 1.82 | 50.7 −0.2 | 32.78 .33 | 21.9 2.0 | 36.42 .83 | 57.4 −0.5 |
| Dec. 4.7 | 48.23 .46 | 9.2 2.5 | 31.21 1.76 | 50.8 +0.4 | 33.11 .32 | 24.1 2.2 | 37.24 .81 | 57.2 0.0 |
| 14.7 | 48.68 .42 | 12.0 3.0 | 32.92 1.65 | 51.5 1.0 | 33.42 .31 | 26.3 2.3 | 38.02 .76 | 57.4 +0.5 |
| 24.6 | 49.07 .36 | 15.2 3.4 | 34.48 1.48 | 52.7 1.5 | 33.71 .28 | 28.7 2.4 | 38.75 .70 | 58.2 1.1 |
| 34.6 | 49.40 +.29 | 18.7 −3.6 | 35.86+1.27 | 54.5 +2.0 | 33.97 +.24 | 31.0 −2.3 | 39.41 +.61 | 59.5 +1.5 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *θ* Ursæ Majoris. | | *ε* Leonis. | | *μ* Leonis. | | *α* Leonis. (*Regulus.*) | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>9 24 | +52° 14′ | h m<br>9 38 | +24° 20′ | h m<br>9 45 | +26° 35′ | h m<br>10 1 | +12° 34′ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.6 | 35.34 +.40 | 22.1 +0.5 | 49.87 +.30 | 37.6 −1.0 | 43.72 +.32 | 21.3 −0.8 | 47.01 +.30 | 21.5 −1.6 |
| 10.6 | 35.71 .34 | 22.8 1.0 | 50.15 .27 | 36.9 0.6 | 44.01 .27 | 20.7 0.5 | 47.29 .27 | 20.1 1.3 |
| 20.6 | 36.01 .27 | 24.0 1.4 | 50.40 .22 | 36.4 −0.3 | 44.26 .23 | 20.3 −0.2 | 47.54 .22 | 18.9 1.1 |
| 30.5 | 36.25 .20 | 25.5 1.6 | 50.59 .16 | 36.3 0.0 | 44.46 .18 | 20.3 +0.1 | 47.74 .18 | 17.9 0.8 |
| Feb. 9.5 | 36.40 .12 | 27.3 1.8 | 50.72 .11 | 36.4 +0.2 | 44.61 .12 | 20.5 0.4 | 47.89 .12 | 17.2 0.5 |
| 19.5 | 36.48 +.04 | 29.2 2.0 | 50.81 .06 | 36.7 0.5 | 44.70 .07 | 21.0 0.6 | 47.99 .07 | 16.8 0.3 |
| 29.4 | 36.48 −.04 | 31.2 2.0 | 50.84 +.01 | 37.3 0.7 | 44.74 +.01 | 21.7 0.8 | 48.04 +.03 | 16.7 −0.1 |
| Mar. 10.4 | 36.41 .10 | 33.2 2.0 | 50.82 −.04 | 38.0 0.8 | 44.73 −.04 | 22.5 0.9 | 48.04 −.02 | 16.7 +0.1 |
| 20.4 | 36.28 .16 | 35.1 1.8 | 50.76 .08 | 38.8 0.8 | 44.67 .07 | 23.4 1.0 | 48.01 .05 | 16.9 0.3 |
| 30.4 | 36.10 .20 | 36.8 1.6 | 50.67 .11 | 39.7 0.9 | 44.58 .11 | 24.4 1.0 | 47.94 .08 | 17.3 0.4 |
| Apr. 9.3 | 35.88 .23 | 38.2 1.3 | 50.55 .13 | 40.5 0.8 | 44.46 .13 | 25.3 0.9 | 47.85 .10 | 17.8 0.5 |
| 19.3 | 35.64 .25 | 39.3 1.0 | 50.42 .14 | 41.3 0.7 | 44.33 .14 | 26.2 0.8 | 47.74 .12 | 18.3 0.5 |
| 29.3 | 35.39 .25 | 40.1 0.6 | 50.28 .14 | 42.0 0.6 | 44.19 .14 | 27.0 0.7 | 47.62 .12 | 18.8 0.6 |
| May 9.3 | 35.14 .24 | 40.5 +0.2 | 50.14 .13 | 42.6 0.5 | 44.05 .14 | 27.6 0.5 | 47.50 .12 | 19.4 0.6 |
| 19.2 | 34.91 .22 | 40.5 −0.2 | 50.01 .12 | 43.0 0.4 | 43.91 .13 | 28.0 0.4 | 47.38 .11 | 19.9 0.5 |
| 29.2 | 34.71 .19 | 40.1 0.6 | 49.90 .11 | 43.3 0.2 | 43.79 .11 | 28.3 +0.2 | 47.28 .10 | 20.4 0.5 |
| June 8.2 | 34.53 .16 | 39.3 0.9 | 49.80 .09 | 43.4 +0.1 | 43.69 .09 | 28.4 0.0 | 47.18 .09 | 20.8 0.4 |
| 18.1 | 34.39 .12 | 38.2 1.3 | 49.73 .06 | 43.4 −0.1 | 43.61 .07 | 28.3 −0.2 | 47.11 .07 | 21.2 0.3 |
| 28.1 | 34.29 .07 | 36.8 1.6 | 49.68 .04 | 43.2 0.3 | 43.56 .04 | 28.1 0.3 | 47.05 .05 | 21.5 0.3 |
| July 8.1 | 34.24 −.03 | 35.1 1.8 | 49.66 −.01 | 42.8 0.4 | 43.53 −.02 | 27.7 0.5 | 47.02 −.03 | 21.7 0.2 |
| 18.1 | 34.24 +.02 | 33.2 2.1 | 49.66 +.02 | 42.4 0.6 | 43.53 +.01 | 27.1 0.7 | 47.00 .00 | 21.8 +0.1 |
| 28.0 | 34.28 .07 | 31.0 2.2 | 49.70 .05 | 41.7 0.7 | 43.55 .04 | 26.3 0.9 | 47.01 +.02 | 21.8 −0.1 |
| Aug. 7.0 | 34.37 .11 | 28.7 2.4 | 49.76 .08 | 40.9 0.9 | 43.61 .07 | 25.4 1.0 | 47.05 .05 | 21.7 0.2 |
| 17.0 | 34.50 .16 | 26.3 2.5 | 49.85 .11 | 40.0 1.0 | 43.70 .10 | 24.3 1.2 | 47.11 .08 | 21.4 0.4 |
| 27.0 | 34.69 .21 | 23.8 2.6 | 49.96 .14 | 38.9 1.2 | 43.81 .13 | 23.0 1.3 | 47.20 .11 | 20.9 0.5 |
| Sept. 5.9 | 34.92 .25 | 21.2 2.6 | 50.13 .17 | 37.7 1.3 | 43.96 .17 | 21.7 1.5 | 47.32 .14 | 20.3 0.7 |
| 15.9 | 35.19 .30 | 18.6 2.6 | 50.32 .20 | 36.3 1.5 | 44.14 .20 | 20.1 1.6 | 47.47 .17 | 19.5 0.9 |
| 25.9 | 35.51 .34 | 16.1 2.5 | 50.53 .23 | 34.8 1.6 | 44.36 .23 | 18.5 1.7 | 47.66 .20 | 18.5 1.1 |
| Oct. 5.8 | 35.87 .38 | 13.7 2.4 | 50.78 .27 | 33.1 1.7 | 44.60 .26 | 16.7 1.8 | 47.87 .23 | 17.2 1.3 |
| 15.8 | 36.28 .42 | 11.4 2.2 | 51.06 .30 | 31.4 1.8 | 44.88 .30 | 14.8 1.9 | 48.12 .26 | 15.8 1.5 |
| 25.8 | 36.71 .45 | 9.3 2.0 | 51.37 .32 | 29.5 1.8 | 45.19 .32 | 12.9 1.9 | 48.40 .29 | 14.2 1.7 |
| Nov. 4.8 | 37.17 .48 | 7.5 1.7 | 51.70 .34 | 27.7 1.8 | 45.52 .34 | 11.0 1.9 | 48.70 .32 | 12.4 1.8 |
| 14.7 | 37.66 .49 | 5.9 1.4 | 52.05 .36 | 25.9 1.8 | 45.88 .36 | 9.1 1.9 | 49.03 .33 | 10.5 1.9 |
| 24.7 | 38.15 .50 | 4.8 1.0 | 52.41 .36 | 24.1 1.7 | 46.24 .37 | 7.3 1.7 | 49.37 .34 | 8.6 2.0 |
| Dec. 4.7 | 38.65 .49 | 4.0 0.6 | 52.78 .36 | 22.5 1.5 | 46.61 .37 | 5.7 1.5 | 49.71 .34 | 6.7 1.9 |
| 14.7 | 39.13 .47 | 3.6 −0.2 | 53.13 .35 | 21.1 1.3 | 46.97 .36 | 4.3 1.3 | 50.05 .34 | 4.8 1.9 |
| 24.6 | 39.57 .43 | 3.7 +0.3 | 53.47 .32 | 19.9 1.1 | 47.32 .33 | 3.1 1.0 | 50.38 .32 | 3.0 1.7 |
| 34.6 | 39.97 +.37 | 4.2 +0.7 | 53.78 +.29 | 18.9 −0.8 | 47.63 +.30 | 2.2 −0.7 | 50.68 +.29 | 1.4 −1.5 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *32 Ursæ Majoris. | | γ¹ Leonis. | | *9 Draconis (H.) | | ρ Leonis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>10 9 | ° ′<br>+65 43 | h m<br>10 13 | ° ′<br>+20 27 | h m<br>10 24 | ° ′<br>+76 20 | h m<br>10 26 | ° ′<br>+9 56 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.6 | 3.54 +.61 | 21.0 +0.7 | 9.05 +.32 | 63.0 −1.3 | 35.61 +1.01 | 48.4 +0.8 | 17.74 +.31 | 38.2 −1.8 |
| 10.6 | 4.11 .54 | 21.9 1.2 | 9.35 .28 | 61.8 1.0 | 36.56 .89 | 49.5 1.4 | 18.03 .28 | 36.5 1.6 |
| 20.6 | 4.60 .45 | 23.3 1.6 | 9.61 .24 | 61.0 0.7 | 37.39 .76 | 51.2 1.9 | 18.29 .24 | 35.1 1.3 |
| 30.6 | 5.00 .35 | 25.2 2.0 | 9.83 .20 | 60.5 0.4 | 38.07 .60 | 53.3 2.3 | 18.51 .20 | 33.9 1.0 |
| Feb. 9.5 | 5.30 .24 | 27.4 2.3 | 10.00 .14 | 60.2 −0.1 | 38.58 .42 | 55.8 2.6 | 18.68 .15 | 33.0 0.8 |
| 19.5 | 5.49 .13 | 29.8 2.6 | 10.12 .09 | 60.3 +0.2 | 38.90 .23 | 58.5 2.8 | 18.81 .10 | 32.4 0.5 |
| 29.5 | 5.56 +.02 | 32.4 2.6 | 10.18 +.04 | 60.6 0.4 | 39.04 + .05 | 61.4 2.9 | 18.88 .05 | 32.1 −0.2 |
| Mar. 10.5 | 5.53 −.09 | 35.0 2.6 | 10.20 .00 | 61.1 0.6 | 39.00 − .14 | 64.3 2.9 | 18.91 +.01 | 31.9 0.0 |
| 20.4 | 5.39 .18 | 37.6 2.4 | 10.18 −.04 | 61.8 0.7 | 38.78 .30 | 67.1 2.7 | 18.90 −.03 | 32.0 +0.2 |
| 30.4 | 5.18 .26 | 39.9 2.2 | 10.12 .08 | 62.5 0.8 | 38.40 .45 | 69.7 2.4 | 18.86 .06 | 32.3 0.3 |
| Apr. 9.4 | 4.89 .32 | 41.9 1.9 | 10.03 .10 | 63.3 0.8 | 37.89 .57 | 72.0 2.1 | 18.78 .08 | 32.7 0.4 |
| 19.3 | 4.54 .36 | 43.6 1.5 | 9.92 .12 | 64.1 0.8 | 37.27 .66 | 73.9 1.7 | 18.69 .10 | 33.1 0.5 |
| 29.3 | 4.17 .39 | 44.9 1.0 | 9.80 .12 | 64.9 0.7 | 36.58 .72 | 75.3 1.2 | 18.59 .11 | 33.7 0.5 |
| May 9.3 | 3.77 .40 | 45.7 0.6 | 9.68 .12 | 65.6 0.6 | 35.83 .75 | 76.2 0.6 | 18.48 .11 | 34.2 0.6 |
| 19.3 | 3.38 .39 | 46.0 +0.1 | 9.56 .12 | 66.2 0.5 | 35.08 .76 | 76.5 +0.1 | 18.37 .11 | 34.8 0.6 |
| 29.2 | 3.00 .37 | 45.8 −0.4 | 9.44 .11 | 66.6 0.4 | 34.33 .74 | 76.3 −0.5 | 18.26 .10 | 35.3 0.5 |
| June 8.2 | 2.65 .33 | 45.2 0.9 | 9.34 .09 | 67.0 0.3 | 33.61 .69 | 75.6 1.0 | 18.16 .09 | 35.8 0.5 |
| 18.2 | 2.33 .29 | 44.0 1.4 | 9.26 .08 | 67.2 +0.1 | 32.96 .62 | 74.3 1.5 | 18.08 .08 | 36.3 0.4 |
| 28.2 | 2.07 .24 | 42.5 1.8 | 9.19 .06 | 67.2 0.0 | 32.38 .54 | 72.6 2.0 | 18.01 .06 | 36.7 0.4 |
| July 8.1 | 1.86 .18 | 40.5 2.1 | 9.15 .03 | 67.1 −0.2 | 31.89 .44 | 70.4 2.4 | 17.96 .04 | 37.0 0.3 |
| 18.1 | 1.72 .11 | 38.2 2.5 | 9.12 −.01 | 66.8 0.3 | 31.50 .33 | 67.9 2.7 | 17.93 −.02 | 37.2 0.2 |
| 28.1 | 1.64 −.05 | 35.6 2.7 | 9.13 +.01 | 66.4 0.5 | 31.23 .21 | 65.0 3.1 | 17.92 .00 | 37.3 +0.1 |
| Aug. 7.0 | 1.63 +.02 | 32.7 3.0 | 9.15 .04 | 65.8 0.7 | 31.09 − .09 | 61.8 3.3 | 17.94 +.03 | 37.3 −0.1 |
| 17.0 | 1.68 .10 | 29.7 3.1 | 9.21 .07 | 65.1 0.8 | 31.06 + .04 | 58.4 3.5 | 17.97 .05 | 37.1 0.2 |
| 27.0 | 1.82 .17 | 26.5 3.2 | 9.29 .10 | 64.1 1.0 | 31.17 .17 | 54.9 3.6 | 18.04 .08 | 36.8 0.4 |
| Sept. 6.0 | 2.02 .24 | 23.3 3.3 | 9.41 .13 | 63.0 1.2 | 31.40 .30 | 51.3 3.6 | 18.13 .11 | 36.3 0.6 |
| 15.9 | 2.30 .31 | 20.0 3.3 | 9.55 .16 | 61.7 1.4 | 31.77 .43 | 47.7 3.6 | 18.26 .14 | 35.6 0.8 |
| 25.9 | 2.65 .38 | 16.8 3.2 | 9.73 .20 | 60.2 1.6 | 32.26 .56 | 44.2 3.5 | 18.42 .18 | 34.7 1.1 |
| Oct. 5.9 | 3.06 .45 | 13.7 3.0 | 9.95 .23 | 58.6 1.7 | 32.88 .68 | 40.9 3.3 | 18.61 .21 | 33.5 1.3 |
| 15.9 | 3.55 .52 | 10.8 2.8 | 10.19 .26 | 56.8 1.8 | 33.62 .79 | 37.7 3.0 | 18.84 .24 | 32.1 1.5 |
| 25.8 | 4.10 .58 | 8.1 2.5 | 10.47 .29 | 54.9 1.9 | 34.47 .90 | 34.9 2.7 | 19.10 .28 | 30.5 1.7 |
| Nov. 4.8 | 4.70 .63 | 5.8 2.2 | 10.78 .32 | 53.0 2.0 | 35.41 .99 | 32.4 2.3 | 19.39 .30 | 28.7 1.9 |
| 14.8 | 5.35 .66 | 3.8 1.8 | 11.11 .34 | 50.9 2.0 | 36.43 1.05 | 30.3 1.8 | 19.70 .33 | 26.8 2.0 |
| 24.7 | 6.02 .68 | 2.3 1.3 | 11.46 .35 | 48.9 2.0 | 37.51 1.10 | 28.7 1.3 | 20.04 .34 | 24.8 2.0 |
| Dec. 4.7 | 6.71 .69 | 1.2 0.8 | 11.82 .36 | 47.0 1.9 | 38.61 1.11 | 27.7 0.7 | 20.38 .35 | 22.8 2.1 |
| 14.7 | 7.39 .67 | 0.7 −0.2 | 12.18 .35 | 45.2 1.7 | 39.72 1.09 | 27.3 −0.1 | 20.72 .34 | 20.7 2.0 |
| 24.7 | 8.04 .64 | 0.8 +0.3 | 12.52 .33 | 43.7 1.5 | 40.79 1.04 | 27.4 +0.5 | 21.05 .32 | 18.7 1.9 |
| 34.6 | 8.65 +.58 | 1.3 +0.8 | 12.84 +.31 | 42.3 −1.2 | 41.79 + .95 | 28.2 +1.1 | 21.37 +.30 | 17.0 −1.7 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | η Argus. | | l Leonis. | | α Ursæ Majoris. | | δ Leonis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>10 40 | ° ′<br>−59 1 | h m<br>10 42 | ° ′<br>+11 11 | h m<br>10 56 | ° ′<br>+62 24 | h m<br>11 7 | ° ′<br>+21 11 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.7 | 15.60 +.45 | 37.7 −3.0 | 45.04 +.32 | 62.2 −1.8 | 5.87 +.59 | 56.8 −0.1 | 31.52 +.35 | 64.8 −1.6 |
| 10.6 | 16.03 .40 | 40.8 3.3 | 45.35 .29 | 60.5 1.6 | 6.44 .54 | 57.1 +0.5 | 31.85 .32 | 63.4 1.3 |
| 20.6 | 16.39 .33 | 44.3 3.6 | 45.62 .25 | 59.1 1.3 | 6.95 .47 | 57.9 1.1 | 32.15 .29 | 62.3 0.9 |
| 30.6 | 16.68 .26 | 47.9 3.7 | 45.85 .21 | 57.9 1.0 | 7.38 .40 | 59.2 1.6 | 32.42 .24 | 61.5 0.6 |
| Feb. 9.6 | 16.90 .18 | 51.7 3.8 | 46.04 .17 | 57.0 0.7 | 7.74 .31 | 60.9 2.0 | 32.64 .20 | 61.2 −0.2 |
| 19.5 | 17.04 .10 | 55.5 3.8 | 46.18 .12 | 56.4 0.4 | 8.00 .22 | 63.1 2.3 | 32.81 .15 | 61.1 +0.1 |
| 29.5 | 17.10 +.02 | 59.2 3.7 | 46.27 .07 | 56.1 −0.2 | 8.17 .12 | 65.5 2.5 | 32.93 .10 | 61.4 0.4 |
| Mar. 10.5 | 17.09 −.05 | 62.8 3.5 | 46.32 +.03 | 56.1 +0.1 | 8.24 +.02 | 68.0 2.6 | 33.01 .05 | 61.9 0.7 |
| 20.5 | 17.01 .11 | 66.2 3.2 | 46.32 −.01 | 56.3 0.3 | 8.22 −.07 | 70.6 2.6 | 33.04 +.01 | 62.7 0.8 |
| 30.4 | 16.87 .17 | 69.2 2.9 | 46.29 .05 | 56.6 0.4 | 8.11 .15 | 73.2 2.5 | 33.03 −.03 | 63.6 1.0 |
| Apr. 9.4 | 16.68 .22 | 72.0 2.6 | 46.23 .07 | 57.0 0.5 | 7.93 .21 | 75.5 2.2 | 32.98 .06 | 64.5 1.0 |
| 19.4 | 16.44 .25 | 74.3 2.1 | 46.15 .09 | 57.6 0.6 | 7.69 .26 | 77.6 1.9 | 32.91 .08 | 65.6 1.0 |
| 29.3 | 16.18 .28 | 76.2 1.7 | 46.06 .10 | 58.2 0.6 | 7.41 .30 | 79.4 1.6 | 32.82 .10 | 66.6 1.0 |
| May 9.3 | 15.89 .30 | 77.7 1.2 | 45.95 .11 | 58.8 0.6 | 7.09 .33 | 80.7 1.1 | 32.72 .11 | 67.5 0.9 |
| 19.3 | 15.58 .31 | 78.6 0.7 | 45.84 .11 | 59.4 0.6 | 6.76 .34 | 81.6 0.7 | 32.61 .11 | 68.4 0.8 |
| 29.3 | 15.27 .31 | 79.1 −0.2 | 45.74 .10 | 60.0 0.6 | 6.43 .33 | 82.0 +0.2 | 32.50 .11 | 69.1 0.6 |
| June 8.2 | 14.96 .31 | 79.1 +0.3 | 45.64 .09 | 60.5 0.5 | 6.10 .32 | 82.0 −0.3 | 32.39 .11 | 69.6 0.5 |
| 18.2 | 14.66 .29 | 78.5 0.8 | 45.55 .08 | 61.0 0.4 | 5.79 .29 | 81.5 0.8 | 32.29 .10 | 70.0 0.3 |
| 28.2 | 14.37 .27 | 77.5 1.3 | 45.48 .07 | 61.4 0.3 | 5.51 .26 | 80.5 1.2 | 32.20 .09 | 70.2 +0.1 |
| July 8.2 | 14.12 .24 | 76.0 1.7 | 45.42 .05 | 61.6 0.2 | 5.27 .22 | 79.0 1.7 | 32.12 .07 | 70.2 −0.1 |
| 18.1 | 13.89 .21 | 74.2 2.0 | 45.38 .03 | 61.8 +0.1 | 5.07 .18 | 77.1 2.1 | 32.05 .06 | 70.1 0.3 |
| 28.1 | 13.71 .16 | 72.0 2.4 | 45.35 −.01 | 61.9 0.0 | 4.91 .13 | 74.9 2.4 | 32.01 .04 | 69.6 0.5 |
| Aug. 7.1 | 13.57 .11 | 69.5 2.6 | 45.35 +.01 | 61.8 −0.2 | 4.81 .07 | 72.4 2.7 | 31.98 −.01 | 69.0 0.7 |
| 17.0 | 13.49 −.05 | 66.8 2.7 | 45.38 .04 | 61.5 0.3 | 4.77 −.02 | 69.5 3.0 | 31.98 +.01 | 68.2 0.9 |
| 27.0 | 13.47 +.02 | 64.0 2.8 | 45.42 .06 | 61.1 0.5 | 4.78 +.05 | 66.5 3.2 | 32.01 .04 | 67.2 1.1 |
| Sept. 6.0 | 13.53 .09 | 61.3 2.7 | 45.50 .09 | 60.5 0.7 | 4.86 .11 | 63.2 3.3 | 32.06 .07 | 66.0 1.3 |
| 16.0 | 13.65 .16 | 58.6 2.6 | 45.61 .13 | 59.7 0.9 | 5.00 .18 | 59.9 3.4 | 32.15 .10 | 64.6 1.5 |
| 25.9 | 13.85 .23 | 56.2 2.3 | 45.75 .16 | 58.7 1.1 | 5.21 .25 | 56.5 3.4 | 32.27 .14 | 62.9 1.7 |
| Oct. 5.9 | 14.12 .31 | 54.1 1.9 | 45.93 .20 | 57.4 1.4 | 5.49 .31 | 53.1 3.4 | 32.43 .18 | 61.1 1.9 |
| 15.9 | 14.46 .37 | 52.4 1.4 | 46.15 .23 | 55.9 1.6 | 5.84 .38 | 49.8 3.2 | 32.63 .22 | 59.1 2.1 |
| 25.9 | 14.87 .43 | 51.3 0.9 | 46.40 .26 | 54.3 1.8 | 6.25 .45 | 46.7 3.0 | 32.87 .26 | 57.0 2.2 |
| Nov. 4.8 | 15.33 .48 | 50.7 +0.3 | 46.68 .30 | 52.4 1.9 | 6.73 .50 | 43.8 2.8 | 33.14 .29 | 54.7 2.3 |
| 14.8 | 15.82 .51 | 50.7 −0.4 | 46.98 .32 | 50.4 2.1 | 7.25 .55 | 41.2 2.4 | 33.44 .32 | 52.4 2.3 |
| 24.8 | 16.35 .53 | 51.4 1.0 | 47.32 .34 | 48.3 2.1 | 7.82 .59 | 39.0 2.0 | 33.78 .34 | 50.1 2.3 |
| Dec. 4.7 | 16.88 .53 | 52.7 1.6 | 47.66 .35 | 46.2 2.1 | 8.42 .61 | 37.3 1.5 | 34.13 .36 | 47.9 2.2 |
| 14.7 | 17.41 .52 | 54.5 2.2 | 48.00 .34 | 44.2 2.0 | 9.04 .62 | 36.0 1.0 | 34.49 .36 | 45.8 2.0 |
| 24.7 | 17.91 .48 | 56.9 2.7 | 48.34 .33 | 42.2 1.9 | 9.65 .60 | 35.4 −0.4 | 34.85 .35 | 43.9 1.8 |
| 34.7 | 18.37 +.44 | 59.8 −3.1 | 48.66 +.31 | 40.4 −1.7 | 10.23 +.56 | 35.2 +0.2 | 35.19 +.33 | 42.3 −1.5 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON

| Mean Solar Date. | δ Crateris. | | τ Leonis. | | *λ Draconis. | | υ Leonis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
| | h m<br>11 13 | ° ′<br>−14 6 | h m<br>11 21 | ° ′<br>+3 31 | h m<br>11 24 | ° ′<br>+70 0 | h m<br>11 30 | ° ′<br>−0 8 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.7 | 8.90 +.33 | 22.0 −2.5 | 34.10 +.33 | 79.7 −2.1 | 3.99 +.77 | 36.0 −0.2 | 36.40 +.33 | 20.8 −2.2 |
| 10.7 | 9.21 .30 | 24.5 2.5 | 34.42 .31 | 77.7 2.0 | 4.73 .72 | 36.2 +0.5 | 36.73 .31 | 23.0 2.1 |
| 20.6 | 9.50 .27 | 27.0 2.4 | 34.71 .28 | 75.8 1.8 | 5.42 .65 | 36.9 1.1 | 37.02 .28 | 25.0 1.9 |
| 30.6 | 9.75 .23 | 29.3 2.3 | 34.97 .24 | 74.2 1.5 | 6.03 .56 | 38.3 1.6 | 37.29 .24 | 26.8 1.7 |
| Feb. 9.6 | 9.96 .18 | 31.6 2.2 | 35.18 .20 | 72.8 1.3 | 6.54 .46 | 40.1 2.0 | 37.51 .20 | 28.4 1.5 |
| 19.5 | 10.12 .14 | 33.7 2.0 | 35.36 .15 | 71.7 1.0 | 6.94 .34 | 42.3 2.4 | 37.69 .16 | 29.7 1.2 |
| 29.5 | 10.23 .09 | 35.5 1.7 | 35.49 .11 | 70.8 0.7 | 7.21 .21 | 44.9 2.7 | 37.83 .11 | 30.8 0.9 |
| Mar. 10.5 | 10.31 .05 | 37.1 1.5 | 35.57 .06 | 70.3 0.4 | 7.36 +.08 | 47.6 2.8 | 37.92 .07 | 31.6 0.7 |
| 20.5 | 10.34 +.01 | 38.5 1.2 | 35.61 +.03 | 70.0 −0.2 | 7.38 −.04 | 50.5 2.9 | 37.97 +.03 | 32.1 0.4 |
| 30.4 | 10.33 −.02 | 39.6 1.0 | 35.62 −.01 | 69.9 0.0 | 7.28 .15 | 53.3 2.8 | 37.99 .00 | 32.4 −0.2 |
| Apr. 9.4 | 10.30 .05 | 40.5 0.7 | 35.60 .04 | 70.0 +0.2 | 7.08 .25 | 55.9 2.6 | 37.97 −.03 | 32.5 0.0 |
| 19.4 | 10.24 .07 | 41.1 0.5 | 35.55 .06 | 70.2 0.3 | 6.78 .34 | 58.3 2.2 | 37.93 .05 | 32.4 +0.2 |
| 29.4 | 10.16 .08 | 41.5 0.3 | 35.48 .08 | 70.6 0.4 | 6.41 .40 | 60.4 1.9 | 37.87 .07 | 32.2 0.3 |
| May 9.3 | 10.07 .10 | 41.6 −0.1 | 35.40 .09 | 71.1 0.5 | 5.98 .45 | 62.0 1.4 | 37.80 .08 | 31.9 0.4 |
| 19.3 | 9.97 .10 | 41.6 +0.2 | 35.31 .09 | 71.6 0.6 | 5.52 .48 | 63.2 0.9 | 37.71 .09 | 31.4 0.5 |
| 29.3 | 9.87 .10 | 41.3 0.4 | 35.21 .10 | 72.2 0.6 | 5.03 .49 | 63.9 +0.4 | 37.62 .09 | 30.9 0.5 |
| June 8.2 | 9.77 .10 | 40.9 0.5 | 35.12 .09 | 72.7 0.6 | 4.54 .49 | 64.0 −0.1 | 37.53 .09 | 30.4 0.6 |
| 18.2 | 9.67 .10 | 40.3 0.7 | 35.03 .09 | 73.3 0.6 | 4.06 .47 | 63.6 0.6 | 37.43 .09 | 29.8 0.6 |
| 28.2 | 9.58 .09 | 39.5 0.8 | 34.94 .08 | 73.9 0.5 | 3.61 .44 | 62.7 1.2 | 37.35 .08 | 29.2 0.6 |
| July 8.2 | 9.49 .08 | 38.6 0.9 | 34.87 .07 | 74.4 0.5 | 3.19 .39 | 61.3 1.6 | 37.27 .08 | 28.6 0.6 |
| 18.1 | 9.42 .07 | 37.7 1.0 | 34.80 .06 | 74.8 0.4 | 2.83 .34 | 59.5 2.1 | 37.20 .07 | 28.1 0.5 |
| 28.1 | 9.36 .05 | 36.6 1.1 | 34.75 .04 | 75.2 0.3 | 2.52 .28 | 57.2 2.5 | 37.14 .05 | 27.6 0.5 |
| Aug. 7.1 | 9.33 −.03 | 35.5 1.1 | 34.72 −.03 | 75.5 0.2 | 2.27 .21 | 54.5 2.8 | 37.10 .03 | 27.1 0.4 |
| 17.1 | 9.31 .00 | 34.5 1.0 | 34.70 .00 | 75.6 +0.1 | 2.10 .13 | 51.6 3.1 | 37.08 −.01 | 26.8 0.3 |
| 27.0 | 9.32 +.03 | 33.5 0.9 | 34.71 +.03 | 75.6 −0.1 | 2.01 −.05 | 48.3 3.4 | 37.08 +.01 | 26.6 +0.1 |
| Sept. 6.0 | 9.36 .06 | 32.7 0.8 | 34.75 .06 | 75.4 0.3 | 2.00 +.04 | 44.9 3.5 | 37.10 .04 | 26.6 −0.1 |
| 16.0 | 9.44 .09 | 32.0 0.6 | 34.82 .09 | 75.1 0.5 | 2.09 .13 | 41.3 3.6 | 37.16 .08 | 26.7 0.3 |
| 25.9 | 9.55 .13 | 31.6 +0.3 | 34.92 .12 | 74.4 0.7 | 2.26 .22 | 37.6 3.7 | 37.26 .11 | 27.1 0.5 |
| Oct. 5.9 | 9.69 .17 | 31.4 0.0 | 35.06 .16 | 73.6 1.0 | 2.52 .32 | 33.9 3.6 | 37.39 .15 | 27.8 0.8 |
| 15.9 | 9.88 .21 | 31.6 −0.3 | 35.24 .20 | 72.4 1.3 | 2.88 .41 | 30.3 3.5 | 37.56 .19 | 28.7 1.1 |
| 25.9 | 10.11 .25 | 32.1 0.7 | 35.45 .23 | 71.1 1.5 | 3.34 .50 | 26.9 3.3 | 37.76 .23 | 29.9 1.3 |
| Nov. 4.8 | 10.38 .28 | 33.0 1.1 | 35.70 .27 | 69.4 1.7 | 3.88 .59 | 23.7 3.0 | 38.01 .26 | 31.4 1.6 |
| 14.8 | 10.67 .31 | 34.3 1.4 | 35.99 .30 | 67.6 2.0 | 4.50 .66 | 20.9 2.7 | 38.29 .30 | 33.1 1.8 |
| 24.8 | 11.00 .33 | 35.9 1.8 | 36.30 .32 | 65.6 2.1 | 5.20 .72 | 18.4 2.2 | 38.60 .32 | 35.1 2.0 |
| Dec. 4.8 | 11.34 .35 | 37.8 2.0 | 36.64 .34 | 63.4 2.2 | 5.94 .76 | 16.4 1.7 | 38.93 .34 | 37.1 2.2 |
| 14.7 | 11.68 .35 | 39.9 2.2 | 36.98 .34 | 61.2 2.2 | 6.71 .78 | 15.0 1.2 | 39.27 .34 | 39.3 2.2 |
| 24.7 | 12.03 .34 | 42.2 2.4 | 37.32 .34 | 59.0 2.2 | 7.49 .78 | 14.1 −0.5 | 39.61 .34 | 41.6 2.2 |
| 34.7 | 12.36 +.32 | 44.6 −2.5 | 37.65 +.32 | 56.9 −2.1 | 8.25 +.74 | 13.9 +0.1 | 39.94 +.32 | 43.8 −2.2 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | β Leonis. | | γ Ursæ Majoris. | | ο Virginis. | | *4 Draconis (H.) | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>11 42 | ° ′<br>+15 15 | h m<br>11 47 | ° ′<br>+54 22 | h m<br>11 58 | ° ′<br>+9 24 | h m<br>12 6 | ° ′<br>+78 17 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.7 | 44.50 +.34 | 50.0 −1.9 | 19.32 +.50 | 46.6 −1.0 | 53.88 +.34 | 74.6 −2.1 | 25.95+1.22 | 57.5 −0.6 |
| 10.7 | 44.84 .33 | 48.2 1.6 | 19.82 .48 | 46.0 −0.4 | 54.22 .33 | 72.6 1.9 | 27.16 1.19 | 57.3 +0.1 |
| 20.6 | 45.15 .30 | 46.7 1.4 | 20.28 .44 | 45.9 +0.2 | 54.53 .30 | 70.9 1.6 | 28.31 1.11 | 57.7 0.8 |
| 30.6 | 45.43 .26 | 45.5 1.0 | 20.70 .39 | 46.4 0.8 | 54.82 .27 | 69.4 1.3 | 29.37 1.00 | 58.8 1.4 |
| Feb. 9.6 | 45.68 .22 | 44.7 0.7 | 21.06 .33 | 47.4 1.3 | 55.07 .23 | 68.2 1.0 | 30.30 .86 | 60.5 1.9 |
| 19.6 | 45.87 .18 | 44.2 −0.3 | 21.36 .26 | 48.9 1.7 | 55.28 .19 | 67.4 0.7 | 31.07 .68 | 62.6 2.4 |
| 29.5 | 46.03 .13 | 44.0 0.0 | 21.58 .19 | 50.8 2.1 | 55.44 .14 | 66.9 0.4 | 31.66 .49 | 65.2 2.7 |
| Mar. 10.5 | 46.14 .09 | 44.2 +0.3 | 21.73 .11 | 53.0 2.3 | 55.56 .10 | 66.7 −0.1 | 32.04 .28 | 68.0 2.9 |
| 20.5 | 46.20 .05 | 44.6 0.5 | 21.80 +.04 | 55.4 2.4 | 55.65 .06 | 66.7 +0.2 | 32.22 +.08 | 71.0 3.0 |
| 30.4 | 46.23 +.01 | 45.2 0.7 | 21.81 −.03 | 57.8 2.5 | 55.69 +.03 | 66.9 0.4 | 32.20 −.13 | 74.0 3.0 |
| Apr. 9.4 | 46.22 −.03 | 45.9 0.8 | 21.75 .09 | 60.3 2.4 | 55.70 −.01 | 67.4 0.6 | 31.98 .31 | 76.9 2.9 |
| 19.4 | 46.18 .05 | 46.8 0.9 | 21.64 .14 | 62.6 2.2 | 55.68 .03 | 68.0 0.7 | 31.58 .48 | 79.7 2.6 |
| 29.4 | 46.12 .07 | 47.7 0.9 | 21.49 .18 | 64.7 2.0 | 55.64 .05 | 68.7 0.7 | 31.02 .62 | 82.1 2.3 |
| May 9.3 | 46.04 .08 | 48.6 0.9 | 21.29 .21 | 66.5 1.7 | 55.57 .07 | 69.5 0.8 | 30.34 .74 | 84.1 1.8 |
| 19.3 | 45.95 .09 | 49.5 0.8 | 21.08 .23 | 68.0 1.3 | 55.50 .08 | 70.2 0.8 | 29.56 .83 | 85.7 1.3 |
| 29.3 | 45.86 .10 | 50.3 0.7 | 20.84 .24 | 69.1 0.9 | 55.41 .09 | 71.0 0.7 | 28.70 .89 | 86.8 0.8 |
| June 8.3 | 45.76 .10 | 51.0 0.6 | 20.60 .24 | 69.7 +0.4 | 55.32 .09 | 71.7 0.7 | 27.79 .92 | 87.3 +0.3 |
| 18.2 | 45.66 .10 | 51.5 0.5 | 20.36 .24 | 69.9 0.0 | 55.23 .09 | 72.3 0.6 | 26.88 .92 | 87.3 −0.3 |
| 28.2 | 45.56 .09 | 52.0 0.4 | 20.13 .23 | 69.7 −0.5 | 55.14 .09 | 72.8 0.5 | 25.97 .90 | 86.8 0.8 |
| July 8.2 | 45.47 .09 | 52.2 +0.2 | 19.91 .21 | 69.0 0.9 | 55.05 .09 | 73.3 0.4 | 25.09 .85 | 85.7 1.4 |
| 18.1 | 45.39 .08 | 52.4 0.0 | 19.71 .19 | 67.9 1.4 | 54.96 .08 | 73.6 0.2 | 24.27 .79 | 84.1 1.9 |
| 28.1 | 45.32 .06 | 52.3 −0.2 | 19.54 .16 | 66.3 1.8 | 54.89 .07 | 73.7 +0.1 | 23.53 .70 | 82.0 2.3 |
| Aug 7.1 | 45.27 .04 | 52.0 0.4 | 19.40 .13 | 64.4 2.1 | 54.83 .05 | 73.8 −0.1 | 22.87 .60 | 79.4 2.7 |
| 17.1 | 45.24 −.02 | 51.6 0.6 | 19.29 .09 | 62.1 2.4 | 54.78 .04 | 73.6 0.2 | 22.33 .49 | 76.5 3.1 |
| 27.0 | 45.23 .00 | 50.9 0.8 | 19.23 −.04 | 59.5 2.7 | 54.76 −.01 | 73.3 0.4 | 21.91 .36 | 73.2 3.4 |
| Sept. 6.0 | 45.24 +.03 | 50.0 1.0 | 19.21 +.01 | 56.7 3.0 | 54.76 +.01 | 72.8 0.6 | 21.62 .22 | 69.7 3.6 |
| 16.0 | 45.29 .06 | 48.9 1.2 | 19.24 .06 | 53.6 3.2 | 54.79 .05 | 72.0 0.9 | 21.47 −.07 | 66.0 3.8 |
| 26.0 | 45.37 .10 | 47.6 1.4 | 19.32 .11 | 50.3 3.3 | 54.85 .08 | 71.0 1.1 | 21.48 +.09 | 62.2 3.9 |
| Oct. 5.9 | 45.49 .14 | 46.1 1.7 | 19.47 .17 | 47.0 3.4 | 54.95 .12 | 69.8 1.3 | 21.66 .25 | 58.3 3.9 |
| 15.9 | 45.65 .18 | 44.3 1.9 | 19.67 .23 | 43.6 3.4 | 55.10 .16 | 68.3 1.6 | 21.99 .42 | 54.5 3.8 |
| 25.9 | 45.84 .22 | 42.3 2.1 | 19.93 .29 | 40.2 3.3 | 55.28 .20 | 66.7 1.8 | 22.49 .58 | 50.7 3.6 |
| Nov. 4.8 | 46.08 .26 | 40.2 2.2 | 20.25 .35 | 36.9 3.2 | 55.50 .24 | 64.8 2.0 | 23.15 .74 | 47.2 3.4 |
| 14.8 | 46.36 .29 | 37.9 2.3 | 20.63 .40 | 33.8 3.0 | 55.76 .28 | 62.7 2.1 | 23.96 .88 | 44.0 3.1 |
| 24.8 | 46.67 .32 | 35.6 2.3 | 21.06 .45 | 31.0 2.6 | 56.06 .31 | 60.5 2.3 | 24.91 1.01 | 41.1 2.6 |
| Dec. 4.8 | 47.00 .34 | 33.3 2.3 | 21.52 .48 | 28.6 2.2 | 56.38 .33 | 58.2 2.3 | 25.97 1.11 | 38.7 2.1 |
| 14.7 | 47.34 .35 | 31.0 2.2 | 22.02 .50 | 26.6 1.8 | 56.72 .34 | 55.9 2.3 | 27.11 1.18 | 36.9 1.5 |
| 24.7 | 47.69 .35 | 28.9 2.1 | 22.52 .51 | 25.0 1.3 | 57.06 .35 | 53.7 2.2 | 28.31 1.21 | 35.7 0.9 |
| 34.7 | 48.04 +.34 | 26.9 −1.8 | 23.02 +.50 | 24.0 −0.7 | 57.41 +.34 | 51.6 −2.0 | 29.52+1.20 | 35.1 −0.4 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *β Chamæleontis. | | η Virginis. | | α¹ Crucis. | | β Corvi. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* |
| | h m<br>12 10 | ° ′<br>−78 37 | h m<br>12 13 | ° ′<br>+0 0 | h m<br>12 19 | ° ′<br>−62 24 | h m<br>12 27 | ° ′<br>−22 42 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.7 | 63.94 +1.22 | 6.9 −1.6 | 33.87 +.33 | 79.8 −2.2 | 41.41 +.60 | 21.0 −1.8 | 52.37 +.36 | 31.4 −2.3 |
| 10.7 | 65.13 1.15 | 8.7 2.1 | 34.21 .32 | 77.6 2.1 | 42.00 .57 | 23.1 2.3 | 52.73 .35 | 33.7 2.3 |
| 20.7 | 66.23 1.05 | 11.1 2.6 | 34.53 .31 | 75.6 1.9 | 42.55 .53 | 25.6 2.7 | 53.07 .33 | 36.1 2.4 |
| 30.7 | 67.23 .93 | 14.0 3.1 | 34.82 .28 | 73.7 1.7 | 43.04 .47 | 28.4 3.0 | 53.38 .30 | 38.6 2.4 |
| Feb. 9.6 | 68.08 .78 | 17.2 3.4 | 35.07 .24 | 72.1 1.5 | 43.48 .40 | 31.6 3.3 | 53.66 .26 | 41.0 2.4 |
| 19.6 | 68.78 .62 | 20.8 3.7 | 35.29 .20 | 70.8 1.2 | 43.85 .33 | 35.0 3.5 | 53.90 .22 | 43.3 2.3 |
| 29.6 | 69.32 .45 | 24.5 3.8 | 35.47 .16 | 69.7 1.0 | 44.14 .26 | 38.6 3.6 | 54.09 .18 | 45.6 2.2 |
| Mar. 10.5 | 69.69 .28 | 28.4 3.9 | 35.60 .12 | 68.8 0.7 | 44.36 .18 | 42.2 3.6 | 54.25 .14 | 47.6 2.0 |
| 20.5 | 69.89+ .12 | 32.3 3.9 | 35.70 .08 | 68.3 0.4 | 44.50 .11 | 45.8 3.5 | 54.37 .10 | 49.5 1.8 |
| 30.5 | 69.92− .05 | 36.1 3.8 | 35.76 .04 | 68.0 −0.2 | 44.58 +.04 | 49.3 3.4 | 54.44 .06 | 51.2 1.5 |
| Apr. 9.5 | 69.79 .21 | 39.8 3.6 | 35.78 +.01 | 68.0 0.0 | 44.58 −.03 | 52.6 3.2 | 54.49 +.03 | 52.6 1.3 |
| 19.4 | 69.51 .35 | 43.3 3.4 | 35.78 −.02 | 68.1 +0.2 | 44.52 .09 | 55.6 2.9 | 54.50 .00 | 53.8 1.1 |
| 29.4 | 69.09 .49 | 46.5 3.1 | 35.75 .04 | 68.3 0.3 | 44.40 .14 | 58.4 2.6 | 54.48 −.03 | 54.7 0.9 |
| May 9.4 | 68.54 .61 | 49.5 2.7 | 35.71 .05 | 68.7 0.4 | 44.24 .19 | 60.9 2.3 | 54.44 .05 | 55.5 0.6 |
| 19.4 | 67.88 .71 | 52.0 2.3 | 35.65 .07 | 69.2 0.5 | 44.03 .23 | 63.0 1.9 | 54.38 .07 | 56.0 0.4 |
| 29.3 | 67.12 .80 | 54.0 1.8 | 35.57 .08 | 69.7 0.6 | 43.77 .27 | 64.6 1.4 | 54.31 .08 | 56.2 −0.1 |
| June 8.3 | 66.28 .87 | 55.6 1.3 | 35.49 .09 | 70.3 0.6 | 43.49 .30 | 65.8 1.0 | 54.22 .09 | 56.2 +0.1 |
| 18.3 | 65.39 .91 | 56.6 0.8 | 35.40 .09 | 70.9 0.6 | 43.18 .32 | 66.5 −0.5 | 54.12 .10 | 56.1 0.3 |
| 28.2 | 64.47 .93 | 57.1 −0.2 | 35.31 .09 | 71.4 0.6 | 42.86 .33 | 66.8 0.0 | 54.02 .11 | 55.7 0.5 |
| July 8.2 | 63.53 .93 | 57.0 +0.3 | 35.22 .09 | 72.0 0.5 | 42.53 .33 | 66.5 +0.5 | 53.91 .11 | 55.1 0.7 |
| 18.2 | 62.62 .89 | 56.4 0.9 | 35.14 .08 | 72.5 0.5 | 42.20 .32 | 65.7 1.0 | 53.80 .11 | 54.3 0.9 |
| 28.2 | 61.76 .83 | 55.3 1.4 | 35.06 .08 | 73.0 0.4 | 41.89 .30 | 64.5 1.4 | 53.70 .10 | 53.3 1.0 |
| Aug. 7.1 | 60.97 .74 | 53.7 1.9 | 34.99 .07 | 73.4 0.3 | 41.60 .27 | 62.9 1.8 | 53.60 .09 | 52.3 1.1 |
| 17.1 | 60.29 .61 | 51.6 2.3 | 34.93 .05 | 73.7 0.2 | 41.36 .22 | 60.9 2.2 | 53.52 .07 | 51.2 1.1 |
| 27.1 | 59.75 .47 | 49.1 2.6 | 34.89 −.03 | 73.8 +0.1 | 41.16 .17 | 58.6 2.4 | 53.46 .05 | 50.0 1.2 |
| Sept. 6.1 | 59.37 .29 | 46.4 2.8 | 34.88 .00 | 73.8 −0.1 | 41.03 .10 | 56.1 2.6 | 53.42 −.02 | 48.9 1.1 |
| 16.0 | 59.17− .10 | 43.5 3.0 | 34.90 +.03 | 73.6 0.3 | 40.97 −.02 | 53.5 2.7 | 53.42 +.02 | 47.8 1.0 |
| 26.0 | 59.17+ .11 | 40.5 3.0 | 34.95 .07 | 73.2 0.5 | 40.99 +.07 | 50.9 2.6 | 53.45 .06 | 46.9 0.8 |
| Oct. 6.0 | 59.38 .31 | 37.6 2.9 | 35.03 .11 | 72.6 0.8 | 41.10 .16 | 48.3 2.5 | 53.53 .10 | 46.2 0.6 |
| 15.9 | 59.80 .52 | 34.8 2.6 | 35.16 .15 | 71.6 1.1 | 41.30 .25 | 45.9 2.2 | 53.65 .15 | 45.7 +0.3 |
| 25.9 | 60.42 .72 | 32.4 2.3 | 35.33 .19 | 70.5 1.3 | 41.59 .34 | 43.9 1.9 | 53.82 .20 | 45.6 0.0 |
| Nov. 4.9 | 61.22 .89 | 30.3 1.9 | 35.54 .23 | 69.0 1.6 | 41.97 .42 | 42.2 1.4 | 54.04 .24 | 45.8 −0.4 |
| 14.9 | 62.19 1.04 | 28.7 1.3 | 35.79 .27 | 67.3 1.8 | 42.43 .49 | 41.1 0.9 | 54.30 .28 | 46.4 0.8 |
| 24.8 | 63.29 1.15 | 27.7 0.7 | 36.08 .30 | 65.4 2.0 | 42.94 .55 | 40.5 +0.3 | 54.60 .32 | 47.3 1.1 |
| Dec. 4.8 | 64.48 1.23 | 27.2 +0.1 | 36.39 .33 | 63.4 2.2 | 43.51 .59 | 40.4 −0.3 | 54.93 .34 | 48.6 1.5 |
| 14.8 | 65.73 1.26 | 27.4 −0.5 | 36.73 .34 | 61.2 2.2 | 44.11 .61 | 41.0 0.9 | 55.28 .36 | 50.3 1.8 |
| 24.8 | 67.00 1.26 | 28.3 1.1 | 37.07 .34 | 58.9 2.2 | 44.72 .61 | 42.1 1.4 | 55.65 .36 | 52.2 2.1 |
| 34.7 | 68.24 +1.21 | 29.8 −1.8 | 37.41 +.34 | 56.7 −2.2 | 45.32 +.59 | 43.8 −2.0 | 56.01 +.36 | 54.4 −2.3 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *κ Draconis. | | *32 Camelop. (foll.) | | 12 Can. Venaticorum. | | θ Virginis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
| | h m<br>12 28 | ° ′<br>+70 27 | h m<br>12 48 | ° ′<br>+84 4 | h m<br>12 50 | ° ′<br>+38 58 | h m<br>13 3 | ° ′<br>−4 52 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.7 | 12.65 +.78 | 57.0 −1.0 | 19.00 +2.22 | 49.3 −1.0 | 13.84 +.40 | 63.2 −2.0 | 31.66 +.34 | 36.4 −2.3 |
| 10.7 | 13.43 .77 | 56.3 −0.4 | 21.24 2.24 | 48.7 −0.3 | 14.24 .40 | 61.5 1.5 | 32.00 .34 | 38.6 2.2 |
| 20.7 | 14.19 .73 | 56.2 +0.3 | 23.45 2.18 | 48.7 +0.4 | 14.63 .38 | 60.3 0.9 | 32.34 .33 | 40.7 2.1 |
| 30.7 | 14.89 .67 | 56.8 0.9 | 25.57 2.04 | 49.4 1.0 | 15.00 .36 | 59.6 −0.4 | 32.65 .30 | 42.7 1.9 |
| Feb. 9.6 | 15.53 .59 | 58.0 1.5 | 27.51 1.82 | 50.7 1.6 | 15.34 .32 | 59.5 +0.1 | 32.94 .27 | 44.5 1.7 |
| 19.6 | 16.07 .49 | 59.7 2.0 | 29.20 1.54 | 52.5 2.1 | 15.63 .27 | 59.9 0.6 | 33.20 .24 | 46.1 1.5 |
| 29.6 | 16.50 .38 | 61.9 2.4 | 30.58 1.21 | 54.9 2.5 | 15.88 .23 | 60.7 1.1 | 33.42 .20 | 47.4 1.2 |
| Mar. 10.6 | 16.82 .25 | 64.5 2.7 | 31.60 0.84 | 57.6 2.8 | 16.08 .17 | 62.0 1.5 | 33.60 .17 | 48.5 0.9 |
| 20.5 | 17.01 .13 | 67.3 2.9 | 32.25 0.44 | 60.5 3.0 | 16.23 .12 | 63.7 1.8 | 33.75 .13 | 49.3 0.7 |
| 30.5 | 17.08 +.01 | 70.2 2.9 | 32.49 +0.04 | 63.6 3.1 | 16.33 .07 | 65.5 2.0 | 33.86 .09 | 49.9 0.4 |
| Apr. 9.5 | 17.03 −.11 | 73.1 2.9 | 32.34 −0.35 | 66.6 3.0 | 16.38 +.03 | 67.6 2.1 | 33.94 .06 | 50.2 0.2 |
| 19.4 | 16.87 .21 | 75.9 2.7 | 31.81 0.71 | 69.6 2.8 | 16.38 −.01 | 69.7 2.1 | 33.99 .03 | 50.3 −0.1 |
| 29.4 | 16.62 .30 | 78.5 2.4 | 30.93 1.04 | 72.3 2.6 | 16.35 .05 | 71.8 2.1 | 34.01 +.01 | 50.3 +0.1 |
| May 9.4 | 16.28 .38 | 80.8 2.1 | 29.74 1.33 | 74.7 2.2 | 16.28 .08 | 73.8 1.9 | 34.00 −.02 | 50.1 0.3 |
| 19.4 | 15.87 .44 | 82.7 1.7 | 28.29 1.57 | 76.6 1.7 | 16.19 .11 | 75.7 1.7 | 33.98 .04 | 49.8 0.4 |
| 29.3 | 15.41 .48 | 84.1 1.2 | 26.63 1.75 | 78.1 1.2 | 16.07 .13 | 77.3 1.5 | 33.93 .05 | 49.4 0.4 |
| June 8.3 | 14.92 .51 | 85.1 0.7 | 24.81 1.88 | 79.1 0.7 | 15.94 .14 | 78.6 1.2 | 33.87 .07 | 48.9 0.5 |
| 18.3 | 14.41 .52 | 85.5 +0.2 | 22.89 1.95 | 79.5 +0.2 | 15.79 .15 | 79.5 0.8 | 33.80 .08 | 48.4 0.5 |
| 28.3 | 13.89 .52 | 85.4 −0.4 | 20.92 1.97 | 79.4 −0.4 | 15.64 .16 | 80.2 0.4 | 33.71 .09 | 47.9 0.6 |
| July 8.2 | 13.38 .50 | 84.8 0.9 | 18.96 1.94 | 78.7 1.0 | 15.48 .16 | 80.4 +0.1 | 33.62 .10 | 47.3 0 6 |
| 18.2 | 12.89 .47 | 83.6 1.4 | 17.05 1.87 | 77.5 1.5 | 15.32 .16 | 80.3 −0.3 | 33.52 .10 | 46.8 0.6 |
| 28.2 | 12.44 .43 | 82.0 1.9 | 15.23 1.75 | 75.8 2.0 | 15.17 .15 | 79.8 0.7 | 33.42 .10 | 46.2 0.5 |
| Aug. 7.1 | 12.03 .38 | 79.9 2.3 | 13.56 1.60 | 73.5 2.4 | 15.02 .14 | 78.9 1.1 | 33.32 .10 | 45.7 0.5 |
| 17.1 | 11.68 .32 | 77.4 2.7 | 12.05 1.40 | 70.9 2.8 | 14.90 .12 | 77.6 1.4 | 33.23 .08 | 45.3 0.4 |
| 27.1 | 11.39 .25 | 74.5 3.1 | 10.76 1.18 | 67.9 3.2 | 14.79 .10 | 76.0 1.8 | 33.16 .07 | 44.9 0.3 |
| Sept. 6.1 | 11.17 .18 | 71.2 3.4 | 9.70 0.93 | 64.5 3.5 | 14.71 .07 | 74.1 2.1 | 33.10 .05 | 44.7 +0.2 |
| 16.0 | 11.04 −.09 | 67.7 3.6 | 8.91 0.65 | 60.9 3.7 | 14.66 −.03 | 71.8 2.4 | 33.07 −.02 | 44.7 0.0 |
| 26.0 | 11.00 +.01 | 64.1 3.7 | 8.41 0.35 | 57.1 3.9 | 14.65 +.01 | 69.2 2.7 | 33.07 +.02 | 44.8 −0.2 |
| Oct. 6.0 | 11.06 .11 | 60.3 3.8 | 8.22 −0.03 | 53.2 3.9 | 14.69 .06 | 66.5 2.9 | 33.11 .06 | 45.1 0.4 |
| 16.0 | 11.22 .21 | 56.4 3 8 | 8.35 +0.30 | 49.3 3.9 | 14.77 .11 | 63.5 3.1 | 33.19 .10 | 45.7 0.7 |
| 25.9 | 11.48 .32 | 52.6 3.8 | 8.81 0.63 | 45.4 3.8 | 14.91 .16 | 60.4 3.2 | 33.31 .15 | 46.5 1.0 |
| Nov. 4.9 | 11.85 .42 | 49.0 3.6 | 9.60 0.96 | 41.6 3.6 | 15.10 .22 | 57.2 3.2 | 33.48 .19 | 47.6 1.2 |
| 14.9 | 12.32 .52 | 45.5 3.3 | 10.72 1.28 | 38.1 3.3 | 15.34 .27 | 54.0 3.2 | 33.70 .24 | 49.0 1.5 |
| 24.8 | 12.89 .61 | 42.3 3.0 | 12.14 1.57 | 35.0 3.0 | 15.63 .31 | 50.9 3.0 | 33.95 .28 | 50.6 1.7 |
| Dec. 4.8 | 13.53 .68 | 39.6 2.5 | 13.83 1.81 | 32.2 2.5 | 15.96 .35 | 48.0 2.8 | 34.24 .31 | 52.4 1.9 |
| 14.8 | 14.25 .74 | 37.3 2.0 | 15.75 2.01 | 30.0 2.0 | 16.33 .38 | 45.2 2.6 | 34.56 .33 | 54.4 2.1 |
| 24.8 | 15.00 .77 | 35.6 1.4 | 17.83 2.15 | 28.3 1.4 | 16.71 .40 | 42.9 2.2 | 34.90 .34 | 56.5 2.1 |
| 34.7 | 15.77 +.77 | 34.5 −0.8 | 20.03 +2.23 | 27.3 −0.7 | 17.11 +.39 | 40.9 −1.8 | 35.24 +.34 | 58.7 −2.2 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Virginis. (*Spica.*) | | ζ Virginis. | | η Ursæ Majoris. | | η Bootis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | $13^h\ 18^m$ | $-10^\circ\ 30'$ | $13^h\ 28^m$ | $+0^\circ\ 1'$ | $13^h\ 42^m$ | $+49^\circ\ 55'$ | $13^h\ 48^m$ | $+19^\circ\ 0'$ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.8 | 39.38 +.35 | 48.0 −2.1 | 22.23 +.34 | 76.2 −2.2 | 39.24 +.43 | 38.3 −2.3 | 46.60 +.34 | 61.9 −2.3 |
| 10.8 | 39.73 .35 | 50.1 2.1 | 22.57 .34 | 74.0 2.1 | 39.68 .45 | 36.3 1.8 | 46.94 .35 | 59.6 2.1 |
| 20.7 | 40.07 .33 | 52.2 2.1 | 22.91 .33 | 72.0 2.0 | 40.13 .45 | 34.8 1.2 | 47.29 .34 | 57.7 1.8 |
| 30.7 | 40.40 .31 | 54.3 2.0 | 23.23 .31 | 70.1 1.7 | 40.57 .43 | 34.0 −0.6 | 47.63 .33 | 56.1 1.4 |
| Feb. 9.7 | 40.70 .29 | 56.2 1.9 | 23.53 .29 | 68.5 1.5 | 40.99 .40 | 33.7 +0.1 | 47.94 .31 | 54.9 1.0 |
| 19.7 | 40.97 .25 | 58.0 1.7 | 23.80 .26 | 67.1 1.2 | 41.37 .36 | 34.1 0.6 | 48.24 .28 | 54.2 0.5 |
| 29.6 | 41.20 .22 | 59.5 1.5 | 24.04 .22 | 66.0 1.0 | 41.71 .31 | 35.0 1.2 | 48.50 .25 | 53.9 −0.1 |
| Mar. 10.6 | 41.40 .18 | 60.9 1.2 | 24.24 .19 | 65.2 0.7 | 41.99 .26 | 36.5 1.7 | 48.73 .21 | 54.0 +0.3 |
| 20.6 | 41.56 .15 | 62.0 1.0 | 24.41 .15 | 64.7 0.4 | 42.23 .20 | 38.4 2.1 | 48.92 .17 | 54.5 0.7 |
| 30.5 | 41.69 .11 | 62.9 0.8 | 24.54 .12 | 64.5 −0.1 | 42.40 .15 | 40.6 2.4 | 49.07 .14 | 55.3 1.0 |
| Apr. 9.5 | 41.79 .08 | 63.5 0.6 | 24.65 .09 | 64.5 +0.1 | 42.52 .09 | 43.1 2.6 | 49.19 .10 | 56.4 1.2 |
| 19.5 | 41.85 .05 | 64.0 0.4 | 24.72 .06 | 64.7 0.3 | 42.58 +.03 | 45.7 2.7 | 49.27 .07 | 57.7 1.4 |
| 29.5 | 41.89 +.02 | 64.2 −0.2 | 24.76 +.03 | 65.1 0.4 | 42.59 −.02 | 48.3 2.6 | 49.32 .04 | 59.1 1.5 |
| May 9.4 | 41.90 .00 | 64.4 0.0 | 24.77 .00 | 65.5 0.5 | 42.54 .06 | 50.9 2.5 | 49.34 +.01 | 60.6 1.5 |
| 19.4 | 41.88 −.02 | 64.3 +0.1 | 24.76 −.02 | 66.1 0.6 | 42.46 .10 | 53.3 2.3 | 49.34 −.02 | 62.1 1.5 |
| 29.4 | 41.85 .04 | 64.2 0.2 | 24.73 .04 | 66.7 0.6 | 42.34 .14 | 55.5 2.0 | 49.30 .04 | 63.5 1.4 |
| June 8.3 | 41.80 .06 | 63.9 0.3 | 24.69 .06 | 67.4 0.7 | 42.18 .17 | 57.4 1.7 | 49.25 .06 | 64.9 1.3 |
| 18.3 | 41.73 .08 | 63.5 0.4 | 24.62 .07 | 68.0 0.7 | 42.00 .20 | 58.9 1.3 | 49.18 .08 | 66.0 1.1 |
| 28.3 | 41.65 .09 | 63.1 0.5 | 24.54 .09 | 68.7 0.6 | 41.79 .22 | 60.0 0.9 | 49.09 .10 | 67.0 0.9 |
| July 8.3 | 41.56 .10 | 62.6 0.5 | 24.45 .10 | 69.3 0.6 | 41.57 .23 | 60.6 +0.4 | 48.98 .11 | 67.8 0.7 |
| 18.2 | 41.46 .10 | 62.1 0.6 | 24.35 .10 | 69.8 0.5 | 41.34 .24 | 60.8 0.0 | 48.86 .12 | 68.4 0.4 |
| 28.2 | 41.35 .11 | 61.5 0.6 | 24.25 .11 | 70.3 0.4 | 41.10 .24 | 60.5 −0.5 | 48.74 .13 | 68.7 +0.2 |
| Aug. 7.2 | 41.24 .10 | 60.9 0.6 | 24.14 .11 | 70.7 0.3 | 40.87 .23 | 59.8 1.0 | 48.61 .13 | 68.7 −0.1 |
| 17.2 | 41.15 .09 | 60.3 0.6 | 24.04 .10 | 71.0 0.2 | 40.64 .22 | 58.6 1.4 | 48.49 .12 | 68.5 0.4 |
| 27.1 | 41.06 .08 | 59.7 0.5 | 23.94 .09 | 71.1 +0.1 | 40.43 .20 | 57.0 1.8 | 48.37 .11 | 67.9 0.7 |
| Sept. 6.1 | 40.99 .06 | 59.3 0.4 | 23.87 .07 | 71.1 −0.1 | 40.25 .17 | 55.0 2.2 | 48.27 .09 | 67.1 1.0 |
| 16.1 | 40.94 −.03 | 58.9 0.3 | 23.81 .04 | 70.9 0.3 | 40.10 .13 | 52.6 2.6 | 48.18 .07 | 66.0 1.2 |
| 26.0 | 40.93 .00 | 58.7 +0.1 | 23.79 −.01 | 70.6 0.5 | 39.99 .09 | 49 8 2.9 | 48.13 −.04 | 64.7 1.5 |
| Oct. 6.0 | 40.95 +.05 | 58.7 −0.1 | 23.80 +.03 | 70.0 0.7 | 39.93 −.04 | 46.7 3.2 | 48.11 .00 | 63.0 1.8 |
| 16.0 | 41.02 .09 | 58.9 0.3 | 23.85 .07 | 69.1 1.0 | 39.92 +.02 | 43.4 3.4 | 48.13 +.04 | 61.1 2.0 |
| 26.0 | 41.13 .14 | 59.3 0.6 | 23.95 .12 | 68.0 1.2 | 39.97 .09 | 39.9 3.6 | 48.20 .09 | 58.9 2.3 |
| Nov. 4.9 | 41.29 .18 | 60.1 0.9 | 24.09 .17 | 66.7 1.5 | 40.09 .15 | 36.4 3.6 | 48.32 .14 | 56.6 2.5 |
| 14.9 | 41.49 .23 | 61.1 1.2 | 24.28 .21 | 65.1 1.7 | 40.27 .22 | 32.7 3.6 | 48.48 .19 | 54.0 2.6 |
| 24.9 | 41.74 .27 | 62.4 1.4 | 24.52 .25 | 63.3 1.9 | 40.52 .28 | 29.2 3.5 | 48.69 .23 | 51.4 2.7 |
| Dec. 4.8 | 42.03 .30 | 64.0 1.7 | 24.79 .29 | 61.3 2.1 | 40.83 .34 | 25.8 3.3 | 48.95 .27 | 48.7 2.7 |
| 14.8 | 42.34 .33 | 65.7 1.9 | 25.09 .32 | 59.2 2.1 | 41.19 .38 | 22.6 3.0 | 49.24 .31 | 46.0 2.6 |
| 24.8 | 42.68 .34 | 67.7 2.0 | 25.42 .33 | 57.1 2.2 | 41.59 .42 | 19.9 2.6 | 49.56 .33 | 43.4 2.5 |
| 34.8 | 43.03 +.35 | 69.7 −2.1 | 25.76 +.34 | 54.9 −2.2 | 42.02 +.44 | 17.6 −2.1 | 49.90 +.34 | 41.0 −2.3 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | β Centauri. | | *α Draconis. | | α Bootis. (*Arcturus.*) | | θ Bootis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>13 55 | ° ′<br>−59 46 | h m<br>14 1 | ° ′<br>+64 57 | h m<br>14 9 | ° ′<br>+19 49 | h m<br>14 20 | ° ′<br>+52 24 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.8 | 3.46 +.58 | 13.6 −0.6 | 1.92 +.57 | 44.2 −2.4 | 59.94 +.33 | 33.0 −2.5 | 58.12 +.42 | 68.6 −2.6 |
| 10.8 | 4.04 .59 | 14.5 1.1 | 2.51 .60 | 42.1 1.8 | 60.27 .34 | 30.6 2.2 | 58.55 .45 | 66.2 2.1 |
| 20.8 | 4.62 .58 | 15.8 1.6 | 3.12 .61 | 40.7 1.1 | 60.62 .34 | 28.5 1.9 | 59.00 .46 | 64.4 1.5 |
| 30.7 | 5.19 .56 | 17.5 2.0 | 3.73 .60 | 40.0 −0.4 | 60.95 .33 | 26.8 1.5 | 59.46 .45 | 63.1 0.9 |
| Feb. 9.7 | 5.73 .52 | 19.7 2.3 | 4.32 .57 | 39.9 +0.3 | 61.28 .31 | 25.6 1.1 | 59.90 .43 | 62.5 −0.3 |
| 19.7 | 6.23 .48 | 22.1 2.6 | 4.87 .53 | 40.5 0.9 | 61.58 .29 | 24.7 0.6 | 60.32 .40 | 62.6 +0.4 |
| 29.6 | 6.68 .42 | 24.9 2.8 | 5.37 .47 | 41.7 1.5 | 61.85 .26 | 24.3 −0.2 | 60.71 .36 | 63.2 1.0 |
| Mar. 10.6 | 7.08 .37 | 27.8 3.0 | 5.80 .39 | 43.5 2.0 | 62.09 .23 | 24.3 +0.2 | 61.05 .31 | 64.5 1.5 |
| 20.6 | 7.42 .31 | 30.8 3.1 | 6.15 .31 | 45.7 2.4 | 62.30 .19 | 24.8 0.6 | 61.34 .26 | 66.2 2.0 |
| 30.6 | 7.70 .25 | 33.9 3.1 | 6.41 .22 | 48.3 2.7 | 62.47 .15 | 25.6 1.0 | 61.57 .20 | 68.4 2.3 |
| Apr. 9.5 | 7.91 .19 | 37.0 3.1 | 6.58 .13 | 51.1 2.9 | 62.61 .12 | 26.7 1.2 | 61.74 .14 | 70.8 2.6 |
| 19.5 | 8.07 .13 | 40.0 3.0 | 6.67 +.04 | 54.1 3.0 | 62.71 .09 | 28.0 1.4 | 61.86 .09 | 73.5 2.8 |
| 29.5 | 8.17 .07 | 42.9 2.8 | 6.67 −.04 | 57.1 3.0 | 62.78 .05 | 29.4 1.5 | 61.91 +.03 | 76.3 2.8 |
| May 9.4 | 8.21 +.01 | 45.6 2.6 | 6.58 .12 | 60.0 2.8 | 62.82 +.02 | 31 0 1.6 | 61.92 −.03 | 79.1 2.8 |
| 19.4 | 8.19 −.04 | 48.1 2.4 | 6.42 .20 | 62.7 2.6 | 62.83 −.01 | 32.6 1.6 | 61.87 .07 | 81.8 2.6 |
| 29.4 | 8.12 .10 | 50.3 2.1 | 6.19 .26 | 65.2 2.3 | 62.81 .03 | 34.1 1.5 | 61.77 .12 | 84.3 2.4 |
| June 8.4 | 8.00 .15 | 52.2 1.7 | 5.91 .31 | 67.3 1.9 | 62.77 .06 | 35.5 1.4 | 61.63 .16 | 86.5 2.1 |
| 18.3 | 7.83 .19 | 53.8 1.4 | 5.57 .35 | 68.9 1.4 | 62.70 .08 | 36.8 1.2 | 61.46 .19 | 88.4 1.7 |
| 28.3 | 7.62 .23 | 55.0 1.0 | 5.20 .39 | 70.1 0.9 | 62.61 .10 | 37.8 1.0 | 61.25 .22 | 89.9 1.3 |
| July 8.3 | 7.37 .27 | 55.7 0.5 | 4.80 .41 | 70.8 +0.4 | 62.51 .11 | 38.7 0.7 | 61.01 .25 | 91.0 0.8 |
| 18.3 | 7.09 .29 | 56.0 −0.1 | 4.38 .43 | 71.0 −0.1 | 62.39 .13 | 39.3 0.5 | 60.76 .26 | 91.6 +0.4 |
| 28.2 | 6.80 .30 | 55.9 +0.4 | 3.95 .43 | 70.6 0.6 | 62.26 .13 | 39.7 +0.2 | 60.49 .27 | 91.7 −0.1 |
| Aug. 7.2 | 6.49 .30 | 55.3 0.8 | 3.53 .42 | 69.8 1.1 | 62.12 .14 | 39.8 −0.1 | 60.21 .28 | 91.3 0.6 |
| 17.2 | 6.20 .29 | 54.2 1.2 | 3.11 .40 | 68.4 1.6 | 61.98 .14 | 39.6 0.3 | 59.94 .27 | 90.5 1.1 |
| 27.1 | 5.92 .26 | 52.8 1.6 | 2.72 .38 | 66.6 2.1 | 61.85 .13 | 39.1 0.6 | 59.67 .26 | 89.2 1.5 |
| Sept. 6.1 | 5.67 .22 | 51.1 1.9 | 2.37 .33 | 64.3 2.5 | 61.73 .12 | 38.3 0.9 | 59.43 .23 | 87.4 2.0 |
| 16.1 | 5.47 .17 | 49.0 2.2 | 2.06 .28 | 61.6 2.9 | 61.62 .09 | 37.2 1.2 | 59.21 .20 | 85.2 2.4 |
| 26.1 | 5.34 .10 | 46.8 2.3 | 1.81 .22 | 58.5 3.2 | 61.55 .06 | 35.8 1.5 | 59.03 .16 | 82.7 2.8 |
| Oct. 6.0 | 5.28 −.02 | 44.4 2.4 | 1.63 .14 | 55.1 3.5 | 61.50 −.02 | 34.2 1.8 | 58.89 .11 | 79.7 3.1 |
| 16.0 | 5.30 +.06 | 42.0 2.4 | 1.53 −.06 | 51.5 3.7 | 61.50 +.02 | 32.2 2.1 | 58.81 −.05 | 76.5 3.4 |
| 26.0 | 5.40 .16 | 39.8 2.2 | 1.51 +.03 | 47.7 3.9 | 61.54 .07 | 30.0 2.3 | 58.80 +.02 | 73.0 3.6 |
| Nov. 5.0 | 5.60 .25 | 37.6 2.0 | 1.59 .13 | 43.9 3.9 | 61.63 .12 | 27.6 2.5 | 58.85 .09 | 69.3 3.7 |
| 14.9 | 5.89 .33 | 35.8 1.7 | 1.76 .22 | 40.0 3.8 | 61.77 .17 | 25.0 2.7 | 58.97 .16 | 65.6 3.7 |
| 24.9 | 6.26 .41 | 34.4 1.2 | 2.03 .32 | 36.2 3.7 | 61.96 .21 | 22.2 2.8 | 59.16 .23 | 61.9 3.7 |
| Dec. 4.9 | 6.71 .48 | 33.4 0.8 | 2.39 .40 | 32.7 3.4 | 62.20 .26 | 19.4 2.8 | 59.42 .29 | 58.3 3.5 |
| 14.8 | 7.22 .53 | 32.8 +0.3 | 2.83 .48 | 29.4 3.1 | 62.47 .29 | 16.7 2.7 | 59.74 .35 | 54.9 3.3 |
| 24.8 | 7.77 .56 | 32.8 −0.3 | 3.34 .54 | 26.6 2.6 | 62.78 .32 | 14.0 2.6 | 60.11 .40 | 51.8 2.9 |
| 34.8 | 8.34 +.58 | 33.3 −0.9 | 3.90 +.59 | 24.2 −2.1 | 63.10 +.33 | 11.5 −2.4 | 60.53 +.43 | 49.2 −2.4 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *5 Ursæ Minoris. | | α² Centauri. | | ε Bootis. | | α² Libræ. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 14 27 | +76 14 | 14 31 | −60 18 | 14 39 | +27 35 | 14 44 | −15 31 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.8 | 47.82 +.85 | 25.4 −2.4 | 10.34 +.56 | 59.9 −0.1 | 33.77 +.33 | 38.5 −2.6 | 0.36 +.33 | 32.0 +1.6 |
| 10.8 | 48.72 .94 | 23.2 1.8 | 10.91 .58 | 60.2 0.5 | 34.10 .34 | 36.0 2.3 | 0.70 .34 | 33.6 1.7 |
| 20.8 | 49.68 .98 | 21.7 1.2 | 11.49 .58 | 61.0 1.0 | 34.45 .35 | 33.9 1.9 | 1.05 .35 | 35.3 1.7 |
| 30.7 | 50.67 1.00 | 20.9 −0.5 | 12.07 .57 | 62.2 1.4 | 34.80 .35 | 32.2 1.5 | 1.39 .34 | 37.0 1.7 |
| Feb. 9.7 | 51.66 .97 | 20.7 +0.2 | 12.64 .55 | 63.9 1.8 | 35.14 .34 | 30.9 1.0 | 1.73 .33 | 38.7 1.6 |
| 19.7 | 52.61 .92 | 21.2 0.8 | 13.18 .52 | 65.9 2.1 | 35.47 .32 | 30.2 −0.5 | 2.04 .31 | 40.3 1.5 |
| 29.7 | 53.48 .83 | 22.3 1.5 | 13.67 .47 | 68.1 2.4 | 35.77 .29 | 30.0 0.0 | 2.34 .29 | 41.7 1.4 |
| Mar. 10.6 | 54.26 .71 | 24.1 2.0 | 14.12 .42 | 70.6 2.6 | 36.05 .26 | 30.3 +0.5 | 2.61 .26 | 43.0 1.2 |
| 20.6 | 54.90 .57 | 26.3 2.4 | 14.52 .37 | 73.3 2.8 | 36.29 .22 | 31.0 1.0 | 2.86 .23 | 44.1 1.0 |
| 30.6 | 55.40 .42 | 28.9 2.8 | 14.86 .31 | 76.1 2.8 | 36.49 .19 | 32.2 1.4 | 3.07 .20 | 45.0 0.8 |
| Apr. 9.6 | 55.74 .26 | 31.8 3.0 | 15.15 .26 | 79.0 2.9 | 36.66 .15 | 33.7 1.7 | 3.25 .17 | 45.8 0.7 |
| 19.5 | 55.93 +.10 | 34.9 3.1 | 15.37 .20 | 81.9 2.9 | 36.80 .12 | 35.5 1 9 | 3.41 .14 | 46.4 0.5 |
| 29.5 | 55.95 −.06 | 38.0 3.1 | 15.54 .13 | 84.7 2.8 | 36.89 .08 | 37.4 2.0 | 3.53 .11 | 46.8 0.4 |
| May 9.5 | 55.81 .21 | 41.0 3.0 | 15.64 .07 | 87.4 2.7 | 36.95 .05 | 39.5 2.1 | 3.63 .08 | 47.1 0.2 |
| 19.4 | 55.52 .36 | 43.9 2.8 | 15.68 +.01 | 90.0 2.5 | 36.98 +.01 | 41.5 2.0 | 3.70 .05 | 47.3 +0.1 |
| 29.4 | 55.10 .48 | 46.5 2.5 | 15.66 −.05 | 92.3 2.2 | 36.98 −.02 | 43.5 2.0 | 3.74 +.03 | 47.3 0.0 |
| June 8.4 | 54.56 .60 | 48.8 2.1 | 15.59 .11 | 94.4 2.0 | 36.95 .05 | 45.4 1.8 | 3.75 .00 | 47.2 −0.1 |
| 18.4 | 53.92 .69 | 50.7 1.6 | 15.45 .16 | 96.2 1.6 | 36.89 .07 | 47.1 1.6 | 3.73 −.03 | 47.1 0.2 |
| 28.3 | 53.19 .77 | 52.1 1.1 | 15.27 .21 | 97.7 1.3 | 36.80 .10 | 48.6 1.3 | 3.69 .06 | 46.9 0.2 |
| July 8.3 | 52.39 .82 | 52.9 0.6 | 15.04 .25 | 98.8 0.9 | 36.69 .12 | 49.8 1.1 | 3.62 .08 | 46.6 0.3 |
| 18.3 | 51.55 .86 | 53.3 +0.1 | 14.76 .29 | 99.5 −0.5 | 36.56 .14 | 50.7 0.7 | 3.53 .10 | 46.3 0.4 |
| 28.3 | 50.68 .87 | 53.1 −0.4 | 14.46 .32 | 99.7 0.0 | 36.41 .15 | 51.2 0.4 | 3.42 .12 | 45.9 0.4 |
| Aug. 7.2 | 49.80 .87 | 52.4 1.0 | 14.14 .33 | 99.5 +0.4 | 36.26 .16 | 51.5 +0.1 | 3.29 .13 | 45.5 0.5 |
| 17.2 | 48.94 .85 | 51.2 1.5 | 13.81 .33 | 98.8 0.9 | 36.09 .16 | 51.3 −0.3 | 3.16 .14 | 45.0 0.5 |
| 27.2 | 48.12 .80 | 49.4 2.0 | 13.49 .31 | 97.8 1.3 | 35.93 .16 | 50.9 0 7 | 3.03 .13 | 44.5 0.5 |
| Sept. 6.1 | 47.35 .74 | 47.2 2.4 | 13.19 .28 | 96.3 1.6 | 35.78 .15 | 50.0 1.1 | 2.90 .12 | 44.0 0.5 |
| 16.1 | 46.65 .65 | 44.6 2.8 | 12.93 .24 | 94.5 1.9 | 35.64 .13 | 48.8 1.4 | 2.79 .10 | 43.6 0.4 |
| 26.1 | 46.04 .55 | 41.6 3.2 | 12.72 .17 | 92.5 2.2 | 35.53 .10 | 47.3 1.7 | 2.70 .07 | 43.2 0.4 |
| Oct. 6.1 | 45.55 .43 | 38.3 3.5 | 12.58 .10 | 90.2 2.3 | 35.44 .06 | 45.4 2.0 | 2.64 −.04 | 42.9 0.2 |
| 16.0 | 45.19 .29 | 34.7 3.7 | 12.52 −.02 | 87.9 2.4 | 35.40 −.02 | 43.3 2.3 | 2.63 +.01 | 42.7 −0.1 |
| 26.0 | 44.97 −.14 | 30.9 3.9 | 12.55 +.08 | 85.5 2.3 | 35.40 +.03 | 40.8 2.6 | 2.65 .05 | 42.8 +0.1 |
| Nov. 5.0 | 44.91 +.02 | 27.0 3.9 | 12.67 .17 | 83.3 2.2 | 35.46 .08 | 38.1 2.8 | 2.73 .10 | 43.0 0.4 |
| 15.0 | 45.01 .19 | 23.1 3.9 | 12.89 .26 | 81.2 1.9 | 35.56 .13 | 35.3 2.9 | 2.86 .15 | 43.5 0.6 |
| 24.9 | 45.28 .35 | 19.2 3.8 | 13.20 .35 | 79.5 1.6 | 35.72 .18 | 32.3 3.0 | 3.04 .20 | 44.2 0.8 |
| Dec. 4.9 | 45.71 .51 | 15.6 3.5 | 13.59 .43 | 78.1 1.2 | 35.93 .23 | 29.2 3.1 | 3.27 .25 | 45.1 1.1 |
| 14.9 | 46.29 .66 | 12.3 3.2 | 14.05 .49 | 77.1 0.8 | 36.19 .28 | 26.2 3.0 | 3.54 .29 | 46.3 1.3 |
| 24.8 | 47.01 .78 | 9.3 2.7 | 14.56 .54 | 76.6 +0 3 | 36.48 .31 | 23.3 2.8 | 3.84 .32 | 47.7 1.5 |
| 34.8 | 47.85 +.88 | 6.9 −2.2 | 15.12 +.57 | 76.6 −0.3 | 36.80 +.33 | 20.7 −2.5 | 4.17 +.33 | 49.2 +1.6 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *β Ursæ Minoris. | | β Bootis. | | β Libræ. | | $\mu^1$ Bootis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* |
| | $14^{h}\ 51^{m}$ | $+74^{\circ}\ 39'$ | $14^{h}\ 57^{m}$ | $+40^{\circ}\ 52'$ | $15^{h}\ 10^{m}$ | $-8^{\circ}\ 55'$ | $15^{h}\ 19^{m}$ | $+37^{\circ}\ 48'$ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.8 | 3.89 +.73 | 20.0 −2.7 | 15.82 +.34 | 32.2 −2.9 | 19.22 +.31 | 30.3 −1.7 | 47.59 +.31 | 30.3 −3.0 |
| 10.8 | 4.66 .81 | 17.6 2.1 | 16.18 .37 | 29.5 2.5 | 19.54 .33 | 32.0 1.7 | 47.92 .34 | 27.5 2.6 |
| 20.8 | 5.50 .87 | 15.8 1.5 | 16.55 .38 | 27.3 2.0 | 19.87 .33 | 33.7 1.7 | 48.27 .36 | 25.1 2.2 |
| 30.8 | 6.38 .90 | 14.6 0.9 | 16.93 .38 | 25.6 1.5 | 20.21 .33 | 35.3 1.6 | 48.63 .37 | 23.2 1.6 |
| Feb. 9.7 | 7.28 .89 | 14.1 −0.2 | 17.31 .38 | 24.4 0.9 | 20.54 .33 | 36.9 1.5 | 49.00 .37 | 21.8 1.1 |
| 19.7 | 8.15 .85 | 14.2 +0.5 | 17.68 .36 | 23.9 −0.3 | 20.85 .31 | 38.3 1.3 | 49.36 .35 | 21.0 −0.5 |
| 29.7 | 8.98 .79 | 15.1 1.1 | 18.03 .33 | 23.9 +0.3 | 21.16 .29 | 39.5 1.1 | 49.70 .33 | 20.8 +0.1 |
| Mar. 10.7 | 9.72 .70 | 16.5 1.7 | 18.35 .30 | 24.5 0.9 | 21.44 .27 | 40.4 0.9 | 50.02 .31 | 21.2 0.6 |
| 20.6 | 10.36 .59 | 18.5 2.2 | 18.63 .26 | 25.6 1.4 | 21.69 .24 | 41.2 0.7 | 50.31 .27 | 22.1 1.2 |
| 30.6 | 10.89 .46 | 21.0 2.6 | 18.87 .22 | 27.3 1.8 | 21.92 .22 | 41.7 0.4 | 50.57 .24 | 23.5 1.6 |
| Apr. 9.6 | 11.28 .32 | 23.7 2.9 | 19.07 .18 | 29.3 2.2 | 22.12 .19 | 42.0 −0.2 | 50.79 .20 | 25.3 2.0 |
| 19.5 | 11.53 .18 | 26.7 3.1 | 19.23 .13 | 31.6 2.4 | 22.30 .16 | 42.2 0.0 | 50.97 .16 | 27.5 2.3 |
| 29.5 | 11.63 +.03 | 29.9 3.1 | 19.34 .09 | 34.0 2.6 | 22.45 .13 | 42.1 +0.1 | 51.10 .12 | 29.8 2.5 |
| May 9.5 | 11.59 −.11 | 33.0 3.1 | 19.41 .05 | 36.6 2.6 | 22.56 .10 | 41.9 0.2 | 51.20 .08 | 32.4 2.6 |
| 19.5 | 11.42 .24 | 36.0 2.9 | 19.44 +.01 | 39.2 2.6 | 22.65 .08 | 41.7 0.3 | 51.26 +.04 | 35.0 2.6 |
| 29.4 | 11.11 .36 | 38.8 2.7 | 19.42 −.03 | 41.7 2.4 | 22.71 .05 | 41.3 0.4 | 51.28 .00 | 37.5 2.5 |
| June 8.4 | 10.69 .47 | 41.3 2.3 | 19.37 .07 | 44.1 2.2 | 22.74 +.02 | 40.9 0.4 | 51.26 −.04 | 39.9 2.3 |
| 18.4 | 10.17 .57 | 43.5 1.9 | 19.29 .10 | 46.2 2.0 | 22.75 −.01 | 40.4 0.5 | 51.20 .07 | 42.1 2.1 |
| 28.4 | 9.56 .65 | 45.2 1.5 | 19.17 .14 | 48.0 1.6 | 22.72 .04 | 40.0 0.5 | 51.11 .11 | 44.1 1.8 |
| July 8.3 | 8.87 .71 | 46.4 1.0 | 19.02 .16 | 49.4 1.3 | 22.67 .07 | 39.5 0.5 | 50.98 .14 | 45.7 1.5 |
| 18.3 | 8.13 .76 | 47.1 +0.5 | 18.84 .19 | 50.5 0.9 | 22.59 .09 | 39.0 0.5 | 50.83 .17 | 47.0 1.1 |
| 28.3 | 7.36 .79 | 47.3 −0.1 | 18.65 .20 | 51.2 +0.5 | 22.48 .11 | 38.6 0.4 | 50.65 .19 | 47.9 0.7 |
| Aug. 7.2 | 6.57 .80 | 46.9 0.6 | 18.44 .21 | 51.4 0.0 | 22.36 .13 | 38.1 0.4 | 50.46 .20 | 48.5 +0.3 |
| 17.2 | 5.77 .79 | 46.1 1.1 | 18.22 .22 | 51.2 −0.4 | 22.23 .14 | 37.7 0.4 | 50.25 .21 | 48.5 −0.1 |
| 27.2 | 4.99 .76 | 44.7 1.6 | 18.00 .22 | 50.6 0.9 | 22.09 .14 | 37.4 0.3 | 50.03 .21 | 48.2 0.6 |
| Sept. 6.2 | 4.25 .72 | 42.8 2.1 | 17.79 .20 | 49.5 1.3 | 21.96 .13 | 37.1 0.2 | 49.82 .21 | 47.4 1.0 |
| 16.1 | 3.56 .65 | 40.5 2.5 | 17.60 .18 | 48.0 1.7 | 21.84 .12 | 36.9 +0.1 | 49.62 .19 | 46.2 1.4 |
| 26.1 | 2.95 .57 | 37.8 2.9 | 17.43 .15 | 46.1 2.1 | 21.73 .09 | 36.8 0.0 | 49.45 .17 | 44.6 1.8 |
| Oct. 6.1 | 2.43 .47 | 34.6 3.3 | 17.30 .11 | 43.9 2.5 | 21.65 .06 | 36.9 −0.1 | 49.30 .13 | 42.6 2.2 |
| 16.1 | 2.02 .35 | 31.2 3.6 | 17.20 .07 | 41.2 2.8 | 21.61 −.02 | 37.1 0.3 | 49.19 .09 | 40.3 2.5 |
| 26.0 | 1.74 .21 | 27.6 3.8 | 17.16 −.01 | 38.3 3.1 | 21.61 +.02 | 37.4 0.5 | 49.12 −.04 | 37.6 2.8 |
| Nov. 5.0 | 1.60 −.07 | 23.7 3.9 | 17.18 +.04 | 35.1 3.3 | 21.66 .07 | 38.0 0.7 | 49.11 +.02 | 34.6 3.1 |
| 15.0 | 1.61 +.08 | 19.8 3.9 | 17.25 .10 | 31.8 3.4 | 21.76 .13 | 38.8 0.9 | 49.16 .08 | 31.4 3.3 |
| 24.9 | 1.77 .24 | 16.0 3.8 | 17.38 .16 | 28.3 3.5 | 21.91 .17 | 39.8 1.1 | 49.26 .14 | 28.1 3.4 |
| Dec. 4.9 | 2.08 .39 | 12.2 3.6 | 17.58 .22 | 24.9 3.4 | 22.10 .22 | 41.1 1.3 | 49.43 .19 | 24.7 3.4 |
| 14.9 | 2.54 .53 | 8.7 3.4 | 17.82 .27 | 21.5 3.3 | 22.34 .26 | 42.5 1.5 | 49.65 .24 | 21.4 3.3 |
| 24.9 | 3.13 .65 | 5.6 3.0 | 18.12 .32 | 18.3 3.1 | 22.62 .29 | 44.0 1.6 | 49.91 .29 | 18.2 3.1 |
| 34.8 | 3.83 +.75 | 2.9 −2.5 | 18.45 +.35 | 15.4 −2.7 | 22.93 +.32 | 45.7 −1.6 | 50.22 +.32 | 15.2 −2.8 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *γ³ Ursæ Minoris. | | α Coronæ Borealis. | | α Serpentis. | | ε Serpentis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 15 20 | +72 15 | 15 29 | +27 7 | 15 38 | +6 48 | 15 44 | +4 50 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.9 | 54.60 +.57 | 69.6 −3.0 | 25.42 +.29 | 45.5 −2.9 | 8.69 +.28 | 52.5 −2.2 | 37.18 +.28 | 59.5 −2.1 |
| 10.8 | 55.22 .67 | 66.9 2.5 | 25.72 .32 | 42.8 2.5 | 8.98 .30 | 50.3 2.1 | 37.47 .30 | 57.4 2.0 |
| 20.8 | 55.92 .73 | 64.7 1.9 | 26.05 .33 | 40.4 2.2 | 9.29 .32 | 48.3 1.9 | 37.78 .31 | 55.4 1.9 |
| 30.8 | 56.67 .77 | 63.1 1.3 | 26.38 .34 | 38.5 1.8 | 9.61 .32 | 46.5 1.7 | 38.09 .32 | 53.7 1.7 |
| Feb. 9.8 | 57.45 .78 | 62.1 −0.6 | 26.72 .34 | 37.0 1.3 | 9.93 .32 | 45.0 1.4 | 38.41 .32 | 52.1 1.4 |
| 19.7 | 58.23 .77 | 61.9 +0.1 | 27.06 .33 | 35.9 0.8 | 10.25 .31 | 43.7 1.1 | 38.73 .31 | 50.9 1.1 |
| 29.7 | 58.98 .73 | 62.3 0.8 | 27.38 .31 | 35.4 −0.2 | 10.55 .30 | 42.8 0.7 | 39.04 .30 | 50.0 0.7 |
| Mar. 10.7 | 59.68 .67 | 63.4 1.4 | 27.68 .29 | 35.5 +0.3 | 10.84 .28 | 42.3 −0.3 | 39.33 .28 | 49.4 −0.4 |
| 20.6 | 60.30 .58 | 65.0 1.9 | 27.95 .26 | 36.0 0.8 | 11.11 .26 | 42.2 0.0 | 39.60 .26 | 49.2 0.0 |
| 30.6 | 60.83 .48 | 67.2 2.4 | 28.20 .23 | 37.0 1.2 | 11.35 .23 | 42.4 +0.4 | 39.84 .23 | 49.4 +0.3 |
| Apr. 9.6 | 61.26 .37 | 69.8 2.8 | 28.42 .20 | 38.4 1.6 | 11.57 .20 | 42.9 0.7 | 40.06 .21 | 49.8 0.6 |
| 19.6 | 61.57 .25 | 72.7 3.0 | 28.60 .17 | 40.1 1.8 | 11.76 .18 | 43.7 0.9 | 40.26 .18 | 50.5 0.8 |
| 29.5 | 61.76 .13 | 75.8 3.2 | 28.75 .13 | 42.0 2.1 | 11.92 .15 | 44.7 1.1 | 40.43 .16 | 51.4 1.0 |
| May 9.5 | 61.83 +.01 | 78.9 3.2 | 28.86 .10 | 44.2 2.2 | 12.03 .12 | 45.8 1.2 | 40.57 .13 | 52.4 1.1 |
| 19.5 | 61.77 −.11 | 82.1 3.1 | 28.94 .06 | 46.4 2.2 | 12.16 .09 | 47.1 1.3 | 40.68 .10 | 53.6 1.2 |
| 29.5 | 61.60 .23 | 85.1 2.9 | 28.99 +.03 | 48.6 2.2 | 12.23 .06 | 48.4 1.3 | 40.77 .07 | 54.8 1.2 |
| June 8.4 | 61.32 .33 | 87.8 2.6 | 29.00 −.01 | 50.7 2.1 | 12.28 +.03 | 49.7 1.3 | 40.82 .04 | 56.0 1.2 |
| 18.4 | 60.95 .43 | 90.3 2.3 | 28.98 .04 | 52.7 1.9 | 12.29 .00 | 50.9 1.2 | 40.84 +.01 | 57.2 1.2 |
| 28.4 | 60.48 .51 | 92.4 1.9 | 28.92 .07 | 54.5 1.7 | 12.27 −.03 | 52.1 1.1 | 40.83 −.03 | 58.4 1.1 |
| July 8.3 | 59.93 .58 | 94.1 1.4 | 28.83 .10 | 56.1 1.4 | 12.22 .06 | 53.1 1.0 | 40.79 .06 | 59.4 1.0 |
| 18.3 | 59.33 .63 | 95.2 0.9 | 28.72 .13 | 57.3 1.1 | 12.15 .09 | 54.1 0.8 | 40.72 .08 | 60.3 0.8 |
| 28.3 | 58.67 .67 | 95.9 +0.4 | 28.58 .15 | 58.3 0.8 | 12.05 .11 | 54.9 0.7 | 40.62 .11 | 61.0 0.7 |
| Aug. 7.3 | 57.98 .70 | 96.1 −0.1 | 28.43 .17 | 58.9 0.5 | 11.93 .13 | 55.5 0.5 | 40.50 .13 | 61.6 0.5 |
| 17.2 | 57.28 .71 | 95.7 0.6 | 28.25 .18 | 59.2 +0.1 | 11.79 .14 | 55.9 0.3 | 40.36 .14 | 62.1 0.3 |
| 27.2 | 56.58 .70 | 94.8 1.2 | 28.07 .18 | 59.1 −0.3 | 11.64 .15 | 56.1 +0.1 | 40.22 .15 | 62.3 +0.2 |
| Sept. 6.2 | 55.89 .67 | 93.4 1.7 | 27.89 .18 | 58.6 0.7 | 11.49 .15 | 56.1 −0.1 | 40.07 .15 | 62.3 −0.1 |
| 16.2 | 55.24 .63 | 91.5 2.1 | 27.72 .16 | 57.8 1.0 | 11.35 .14 | 55.8 0.3 | 39.92 .14 | 62.2 0.3 |
| 26.1 | 54.64 .56 | 89.1 2.6 | 27.57 .14 | 56.6 1.4 | 11.22 .12 | 55.4 0.6 | 39.79 .12 | 61.8 0.5 |
| Oct. 6.1 | 54.12 .48 | 86.4 3.0 | 27.44 .11 | 55.1 1.7 | 11.12 .09 | 54.7 0.8 | 39.68 .09 | 61.2 0.7 |
| 16.1 | 53.68 .39 | 83.2 3.3 | 27.35 .07 | 53.2 2.1 | 11.05 .06 | 53.7 1.1 | 39.61 .06 | 60.4 0.9 |
| 26.0 | 53.35 .27 | 79.8 3.6 | 27.30 −.03 | 51.0 2.4 | 11.01 −.01 | 52.6 1.3 | 39.57 −.02 | 59.3 1.2 |
| Nov. 5.0 | 53.14 .15 | 76.1 3.8 | 27.30 +.02 | 48.5 2.6 | 11.02 +.04 | 51.1 1.6 | 39.58 +.03 | 58.2 1.4 |
| 15.0 | 53.05 −.02 | 72.3 3.9 | 27.35 .08 | 45.8 2.8 | 11.08 .08 | 49.5 1.8 | 39.63 .08 | 56.5 1.7 |
| 25.0 | 53.10 +.12 | 68.4 3.9 | 27.45 .13 | 42.9 3.0 | 11.19 .13 | 47.6 2.0 | 39.74 .13 | 54.7 1.8 |
| Dec. 4.9 | 53.29 .26 | 64.6 3.8 | 27.60 .18 | 39.9 3.0 | 11.35 .18 | 45.6 2.1 | 39.89 .18 | 52.8 2.0 |
| 14.9 | 53.61 .39 | 61.0 3.6 | 27.81 .23 | 36.8 3.0 | 11.55 .23 | 43.4 2.2 | 40.09 .22 | 50.8 2.1 |
| 24.9 | 54.06 .51 | 57.6 3.2 | 28.06 .27 | 33.9 2.9 | 11.80 .26 | 41.3 2.2 | 40.33 .26 | 48.7 2.1 |
| 34.9 | 54.62 +.61 | 54.6 −2.8 | 28.34 +.30 | 31.1 −2.7 | 12.07 +.29 | 39.1 −2.2 | 40.60 +.29 | 46.6 −2.1 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *ζ Ursæ Minoris. | | ε Coronæ Borealis. | | δ Scorpii. | | $\beta^1$ Scorpii. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* |
| | h m<br>15 48 | ° ′<br>+78 9 | h m<br>15 52 | ° ′<br>+27 13 | h m<br>15 52 | ° ′<br>−22 16 | h m<br>15 58 | ° ′<br>−19 27 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.9 | 28.27+ .68 | 69.1 −3.1 | 26.35 +.27 | 64.0 −2.9 | 58.96 +.30 | 2.7 −0.8 | 12.46 +.29 | 55.4 −1.0 |
| 10.8 | 29.03 .84 | 66.1 2.7 | 26.63 .30 | 61.2 2.6 | 59.27 .33 | 3.7 1.0 | 12.77 .32 | 56.5 1.1 |
| 20.8 | 29.93 .96 | 63.7 2.1 | 26.95 .32 | 58.8 2.3 | 59.61 .34 | 4.7 1.1 | 13.10 .34 | 57.6 1.2 |
| 30.8 | 30.94 1.05 | 61.9 1.5 | 27.27 .33 | 56.7 1.9 | 59.96 .35 | 5.9 1.2 | 13.44 .34 | 58.8 1.2 |
| Feb. 9.8 | 32.02 1.10 | 60.7 0.9 | 27.61 .34 | 55.1 1.4 | 60.31 .35 | 7.1 1.2 | 13.78 .34 | 60.0 1.2 |
| 19.7 | 33.13 1.11 | 60.2 −0.2 | 27.94 .33 | 53.9 0.9 | 60.65 .34 | 8.2 1.2 | 14.12 .34 | 61.2 1.1 |
| 29.7 | 34.23 1.07 | 60.3 +0.5 | 28.27 .32 | 53.3 −0.4 | 60.99 .33 | 9.4 1.1 | 14.45 .32 | 62.2 1.0 |
| Mar. 10.7 | 35.27 1.00 | 61.1 1.1 | 28.58 .30 | 53.2 +0.2 | 61.31 .31 | 10.5 1.0 | 14.77 .31 | 63.2 0.9 |
| 20.7 | 36.22 .90 | 62.5 1.7 | 28.87 .28 | 53.6 0.7 | 61.61 .29 | 11.4 0.9 | 15.07 .29 | 64.1 0.8 |
| 30.6 | 37.06 .77 | 64.5 2.2 | 29.13 .25 | 54.6 1.1 | 61.89 .27 | 12.3 0.8 | 15.35 .27 | 64.8 0.7 |
| Apr. 9.6 | 37.75 .61 | 66.9 2.6 | 29.36 .22 | 55.9 1.5 | 62.14 .24 | 13.1 0.7 | 15.60 .24 | 65.4 0.6 |
| 19.6 | 38.28 .44 | 69.7 2.9 | 29.57 .19 | 57.6 1.8 | 62.37 .22 | 13.7 0.6 | 15.83 .22 | 65.9 0.4 |
| 29.6 | 38.63 .26 | 72.7 3.1 | 29.74 .16 | 59.5 2.1 | 62.58 .19 | 14.3 0.5 | 16.03 .19 | 66.3 0.3 |
| May 9.5 | 38.80+ .07 | 75.8 3.2 | 29.88 .12 | 61.7 2.2 | 62.75 .16 | 14.7 0.4 | 16.21 .16 | 66.6 0.3 |
| 19.5 | 38.79− .11 | 79.0 3.2 | 29.98 .09 | 64.0 2.3 | 62.89 .13 | 15.1 0.4 | 16.35 .13 | 66.8 0.2 |
| 29.5 | 38.59 .29 | 82.1 3.0 | 30.05 .05 | 66.3 2.3 | 63.00 .09 | 15.4 0.3 | 16.47 .10 | 66.9 0.1 |
| June 8.4 | 38.22 .46 | 85.0 2.8 | 30.08 +.01 | 68.5 2.2 | 63.08 .06 | 15.7 0.2 | 16.55 .06 | 67.0 −0.1 |
| 18.4 | 37.68 .61 | 87.7 2.5 | 30.07 −.02 | 70.6 2.0 | 63.12 +.02 | 15.9 0.2 | 16.59 +.03 | 67.1 0.0 |
| 28.4 | 37.00 .75 | 90.0 2.1 | 30.03 .06 | 72.6 1.8 | 63.13 −.01 | 16.0 −0.1 | 16.61 −.01 | 67.1 0.0 |
| July 8.4 | 36.19 .87 | 91.9 1.7 | 29.96 .09 | 74.3 1.6 | 63.10 .05 | 16.1 0.0 | 16.58 .04 | 67.0 +0.1 |
| 18.3 | 35.28 .96 | 93.4 1.2 | 29.86 .12 | 75.8 1.3 | 63.04 .08 | 16.1 0.0 | 16.52 .07 | 66.9 0.1 |
| 28.3 | 34.27 1.04 | 94.4 0.7 | 29.73 .14 | 76.9 1.0 | 62.95 .11 | 16.0 +0.1 | 16.44 .10 | 66.7 0.2 |
| Aug. 7.3 | 33.20 1.09 | 94.9 +0.2 | 29.57 .17 | 77.7 0.6 | 62.83 .13 | 15.8 0.2 | 16.32 .13 | 66.5 0.2 |
| 17.3 | 32.10 1.12 | 94.8 −0.3 | 29.40 .18 | 78.2 +0 3 | 62.69 .15 | 15.6 0.3 | 16.19 .15 | 66.3 0.3 |
| 27.2 | 30.97 1.12 | 94.3 0.8 | 29.21 .19 | 78.3 −0.1 | 62.54 .16 | 15.3 0.4 | 16.03 .16 | 66 0 0.3 |
| Sept. 6.2 | 29.86 1.10 | 93.2 1.3 | 29.03 .19 | 78.0 0.5 | 62.38 .16 | 14.9 0.4 | 15.88 .16 | 65.6 0.4 |
| 16.2 | 28.79 1.05 | 91.6 1.8 | 28.84 .18 | 77.3 0.8 | 62.23 .15 | 14.4 0.5 | 15.73 .15 | 65.3 0.4 |
| 26.1 | 27.78 .97 | 89.6 2.3 | 28.67 .16 | 76.3 1.2 | 62.09 .13 | 13.9 0.5 | 15.59 .13 | 64.9 0.4 |
| Oct. 6.1 | 26.86 .87 | 87.1 2.7 | 28.53 .13 | 74.9 1.6 | 61.98 .10 | 13.5 0.5 | 15.48 .10 | 64.5 0.3 |
| 16.1 | 26.05 .74 | 84.3 3.1 | 28.41 .10 | 73.2 1.9 | 61.90 .06 | 13.0 0.4 | 15.40 .06 | 64.2 0.3 |
| 26.1 | 25.39 .58 | 81.1 3.4 | 28.34 −.05 | 71.1 2.3 | 61.86 −.01 | 12.6 0.3 | 15.36 −.02 | 64.0 −0.2 |
| Nov. 5.0 | 24.89 .41 | 77.6 3.6 | 28.31 .00 | 68.7 2.5 | 61.87 +.04 | 12.4 +0.2 | 15.36 +.03 | 63.9 0.0 |
| 15.0 | 24.57 .22 | 73.9 3.7 | 28.33 +.05 | 66.0 2.8 | 61.94 .09 | 12.3 0.0 | 15.42 .08 | 63.9 +0.1 |
| 25.0 | 24.45− .02 | 70.1 3.8 | 28.41 .10 | 63.2 2.9 | 62.05 .14 | 12.3 −0.2 | 15.53 .14 | 64.1 0.3 |
| Dec. 4.9 | 24.53+ .18 | 66.4 3.7 | 28.54 .15 | 60.2 3.0 | 62.22 .20 | 12.6 0.4 | 15.69 .19 | 64.5 0.5 |
| 14.9 | 24.81 .38 | 62.7 3.6 | 28.72 .20 | 57.2 3.0 | 62.44 .24 | 13.0 0.6 | 15.90 .23 | 65.1 0.7 |
| 24.9 | 25.29 .57 | 59.2 3.3 | 28.94 .25 | 54.2 2.9 | 62.71 .28 | 13.7 0.7 | 16.16 .27 | 65.9 0.9 |
| 34.9 | 25.95+ .74 | 56.1 −3.0 | 29.21 +.29 | 51.4 −2.8 | 63.01 +.31 | 14.5 −0.9 | 16.45 +.30 | 66.8 +1.0 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *Groombridge 2320. | | δ Ophiuchi. | | τ Herculis. | | α Scorpii. (*Antares.*) | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
| | h m<br>16 5 | ° ′<br>+68 7 | h m<br>16 7 | ° ′<br>−3 22 | h m<br>16 15 | ° ′<br>+46 36 | h m<br>16 21 | ° ′<br>−26 29 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.9 | 57.08 +.40 | 53.2 −3.4 | 49.77 +.27 | 31.4 −1.7 | 59.36 +.27 | 17.0 −3.3 | 47.02 +.29 | 20.9 −0.5 |
| 10.9 | 57.52 .49 | 50.0 3.0 | 50.05 .29 | 33.1 1.7 | 59.65 .32 | 13.9 3.0 | 47.33 .32 | 21.5 0.6 |
| 20.9 | 58.04 .56 | 47.3 2.4 | 50.36 .31 | 34.8 1.6 | 59.98 .35 | 11.1 2.6 | 47.66 .34 | 22.2 0.8 |
| 30.8 | 58.62 .61 | 45.2 1.9 | 50.67 .32 | 36.3 1.5 | 60.35 .38 | 8.7 2.1 | 48.01 .35 | 23.0 0.9 |
| Feb. 9.8 | 59.24 .64 | 43.6 1.2 | 50.99 .32 | 37.7 1.3 | 60.73 .39 | 6.9 1.5 | 48.36 .36 | 23.9 0.9 |
| 19.8 | 59.89 .65 | 42.7 −0.5 | 51.31 .31 | 38.9 1.1 | 61.13 .39 | 5.7 0.9 | 48.72 .35 | 24.8 0.9 |
| 29.7 | 60.53 .63 | 42.5 +0.1 | 51.62 .31 | 39.9 0.8 | 61.52 .39 | 5.2 −0.2 | 49.07 .35 | 25.7 0.9 |
| Mar. 10.7 | 61.15 .60 | 43.0 0.8 | 51.92 .29 | 40.6 0.6 | 61.90 .37 | 5.3 +0.4 | 49.41 .33 | 26.6 0.9 |
| 20.7 | 61.73 .55 | 44.1 1.4 | 52.20 .27 | 41.0 −0.3 | 62.25 .34 | 6.0 1.0 | 49.73 .32 | 27.5 0.8 |
| 30.7 | 62.25 .49 | 45.8 2.0 | 52.46 .25 | 41.2 0.0 | 62.58 .31 | 7.2 1.5 | 50.04 .30 | 28.3 0.8 |
| Apr. 9.6 | 62.70 .41 | 48.0 2.4 | 52.71 .23 | 41.0 +0.2 | 62.88 .28 | 9.0 2.0 | 50.32 .27 | 29.0 0.7 |
| 19.6 | 63.06 .32 | 50.7 2.8 | 52.93 .21 | 40.7 0.4 | 63.13 .23 | 11.3 2.4 | 50.59 .25 | 29.7 0.6 |
| 29.6 | 63.34 .23 | 53.6 3.1 | 53.12 .18 | 40.2 0.6 | 63.34 .19 | 13.8 2.7 | 50.82 .22 | 30.3 0.6 |
| May 9.5 | 63.52 .13 | 56.8 3.2 | 53.29 .15 | 39.5 0.7 | 63.51 .14 | 16.6 2.9 | 51.03 .19 | 30.8 0.5 |
| 19.5 | 63.60 +.03 | 60.0 3.2 | 53.43 .13 | 38.8 0.8 | 63.62 .09 | 19.5 3.0 | 51.21 .16 | 31.3 0.5 |
| 29.5 | 63.59 −.06 | 63.2 3.2 | 53.54 .09 | 37.9 0.9 | 63.69 +.04 | 22.6 3.0 | 51.35 .13 | 31.8 0.4 |
| June 8.5 | 63.48 .16 | 66.3 3.0 | 53.62 .06 | 37.1 0.9 | 63.71 −.01 | 25.5 2.9 | 51.46 .09 | 32.2 0.4 |
| 18.4 | 63.28 .25 | 69.2 2.7 | 53.66 +.03 | 36.2 0.8 | 63.68 .05 | 28.3 2.7 | 51.53 .05 | 32.6 0.4 |
| 28.4 | 62.99 .33 | 71.8 2.4 | 53.68 .00 | 35.4 0.8 | 63.60 .10 | 30.8 2.4 | 51.57 +.01 | 32.9 0.3 |
| July 8.4 | 62.62 .40 | 74.0 2.0 | 53.65 −.04 | 34.7 0.7 | 63.48 .15 | 33.1 2.1 | 51.56 −.03 | 33.2 0.2 |
| 18.4 | 62.19 .46 | 75.8 1.6 | 53.60 .07 | 34.0 0.7 | 63.31 .19 | 35.0 1.7 | 51.51 .06 | 33.4 0.2 |
| 28.3 | 61.71 .51 | 77.2 1.1 | 53.52 .10 | 33.4 0.6 | 63.11 .22 | 36.5 1.3 | 51.43 .10 | 33.5 −0.1 |
| Aug. 7.3 | 61.17 .55 | 78.0 0.6 | 53.41 .12 | 32.8 0.5 | 62.88 .25 | 37.6 0.9 | 51.32 .13 | 33.5 0.0 |
| 17.3 | 60.60 .58 | 78.4 +0.1 | 53.28 .14 | 32.4 0.4 | 62.62 .27 | 38.3 +0.4 | 51.19 .15 | 33.5 +0.1 |
| 27.2 | 60.02 .59 | 78.2 −0.4 | 53.14 .15 | 32.1 0.3 | 62.34 .28 | 38.5 −0.1 | 51.03 .16 | 33.3 0.2 |
| Sept. 6.2 | 59.43 .59 | 77.5 0.9 | 52.99 .15 | 31.9 +0.1 | 62.06 .28 | 38.2 0.5 | 50.86 .17 | 33.0 0.3 |
| 16.2 | 58.85 .57 | 76.4 1.5 | 52.84 .15 | 31.9 0.0 | 61.78 .28 | 37.4 1.0 | 50.69 .16 | 32.6 0.4 |
| 26.2 | 58.30 .53 | 74.7 1.9 | 52.70 .13 | 32.0 −0.2 | 61.51 .26 | 36.2 1.5 | 50.54 .15 | 32.1 0.5 |
| Oct. 6.1 | 57.79 .47 | 72.5 2.4 | 52.58 .11 | 32.2 0.3 | 61.27 .23 | 34.5 1.9 | 50.40 .12 | 31.6 0.5 |
| 16.1 | 57.35 .41 | 69.9 2.8 | 52.49 .07 | 32.6 0.5 | 61.06 .19 | 32.3 2.4 | 50.30 .09 | 31.1 0.6 |
| 26.1 | 56.99 .32 | 66.9 3.1 | 52.44 −.03 | 33.2 0.7 | 60.90 .14 | 29.8 2.7 | 50.23 −.04 | 30.5 0.5 |
| Nov. 5.0 | 56.71 .23 | 63.6 3.5 | 52.43 +.02 | 34.0 0.9 | 60.79 .08 | 26.9 3.1 | 50.22 +.01 | 30.1 0.4 |
| 15.0 | 56.54 −.12 | 60.0 3.7 | 52.47 .06 | 35.0 1.1 | 60.74 −.02 | 23.7 3.3 | 50.25 .06 | 29.7 0.3 |
| 25.0 | 56.48 .00 | 56.3 3.8 | 52.56 .11 | 36.2 1.3 | 60.76 +.05 | 20.3 3.5 | 50.35 .12 | 29.4 +0.2 |
| Dec. 5.0 | 56.53 +.11 | 52.5 3.8 | 52.69 .16 | 37.5 1.4 | 60.84 .11 | 16.8 3.6 | 50.49 .17 | 29.3 0.0 |
| 14.9 | 56.70 .23 | 48.7 3.7 | 52.88 .21 | 39 0 1.6 | 60.98 .18 | 13.2 3.5 | 50.69 .22 | 29.4 −0.2 |
| 24.9 | 56.97 .33 | 45.1 3.5 | 53.10 .25 | 40.7 1.6 | 61.19 .24 | 9.7 3.4 | 50.93 .27 | 29.7 0.4 |
| 34.9 | 57.36 +.43 | 41.7 −3.2 | 53.37 +.28 | 42.3 −1.7 | 61.45 +.29 | 6.4 −3.2 | 51.22 +.30 | 30.1 −0.6 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | η Draconis. |  | *A Draconis. |  | ζ Ophiuchi. |  | *α Trianguli Australis. |  |
|---|---|---|---|---|---|---|---|---|
|  | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* |
|  | $16^{h}\ 22^{m}$ | $+61^{\circ}\ 47'$ | $16^{h}\ 28^{m}$ | $+69^{\circ}\ 1'$ | $16^{h}\ 30^{m}$ | $-10^{\circ}\ 18'$ | $16^{h}\ 35^{m}$ | $-68^{\circ}\ 47'$ |
|  | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.9 | 17.04 +.32 | 24.3 −3.5 | 11.49 +.35 | 52.2 −3.5 | 18.68 +.26 | 56.9 −1.3 | 29.45 +.57 | 46.8 +1.8 |
| 10.9 | 17.39 .38 | 21.0 3.1 | 11.89 .45 | 48.9 3.1 | 18.95 .29 | 58.2 1.3 | 30.07 .66 | 45.2 1.4 |
| 20.8 | 17.81 .44 | 18.2 2.6 | 12.38 .53 | 46.0 2.7 | 19.25 .31 | 59.5 1.3 | 30.75 .72 | 44.1 1.0 |
| 30.8 | 18.27 .49 | 15.8 2.1 | 12.95 .60 | 43.7 2.1 | 19.56 .32 | 60.8 1.2 | 31.50 .76 | 43.3 0.6 |
| Feb. 9.8 | 18.77 .52 | 14.0 1.5 | 13.57 .64 | 41.9 1.5 | 19.88 .32 | 62.0 1.1 | 32.28 .79 | 42.9 +0.2 |
| 19.8 | 19.29 .53 | 12.9 0.8 | 14.22 .66 | 40.7 0.8 | 20.21 .32 | 63.1 1.0 | 33.07 .80 | 43.0 −0.3 |
| 29.7 | 19.82 .52 | 12.4 −0.1 | 14.89 .66 | 40.2 −0.1 | 20.53 .32 | 64.0 0.8 | 33.87 .79 | 43.5 0.7 |
| Mar. 10.7 | 20.33 .50 | 12.6 +0.5 | 15.54 .64 | 40.4 +0.6 | 20.84 .31 | 64.6 0.6 | 34.65 .77 | 44.3 1.0 |
| 20.7 | 20.81 .46 | 13.4 1.2 | 16.16 .60 | 41.3 1.2 | 21.14 .29 | 65.1 0.4 | 35.41 .74 | 45.5 1.4 |
| 30.7 | 21.26 .42 | 14.9 1.8 | 16.73 .54 | 42.8 1.8 | 21.42 .27 | 65.4 −0.2 | 35.13 .70 | 47.1 1.7 |
| Apr. 9.6 | 21.65 .37 | 16.9 2.3 | 17.23 .46 | 44.8 2.3 | 21.68 .25 | 65.5 0.0 | 36.80 .64 | 48.9 2.0 |
| 19.6 | 21.99 .30 | 19.4 2.7 | 17.66 .38 | 47.3 2.7 | 21.93 .23 | 65.4 +0.2 | 37.41 .58 | 51.0 2.2 |
| 29.6 | 22.26 .23 | 22.2 3.0 | 17.99 .29 | 50.2 3.0 | 22.15 .21 | 65.1 0.3 | 37.96 .51 | 53.3 2.4 |
| May 9.5 | 22.45 .16 | 25.3 3.1 | 18.23 .19 | 53.2 3.2 | 22.34 .18 | 64.8 0.4 | 38.43 .43 | 55.7 2.5 |
| 19.5 | 22.57 .08 | 28.5 3.2 | 18.36 +.09 | 56.5 3.3 | 22.51 .15 | 64.3 0.5 | 38.81 .34 | 58.3 2.6 |
| 29.5 | 22.62 +.01 | 31.7 3.2 | 18.40 −.02 | 59.7 3.2 | 22.64 .12 | 63.8 0.5 | 39.11 .25 | 60.9 2.6 |
| June 8.5 | 22.59 −.07 | 34.9 3.1 | 18.33 .12 | 62.9 3.1 | 22.75 .09 | 63.3 0.5 | 39.31 .15 | 63.5 2.6 |
| 18.4 | 22.49 .14 | 37.8 2.9 | 18.16 .21 | 66.0 2.9 | 22.82 .05 | 62.8 0.5 | 39.42 +.05 | 66.1 2.5 |
| 28.4 | 22.32 .21 | 40.6 2.6 | 17.90 .31 | 68.7 2.6 | 22.85 +.02 | 62.2 0.5 | 39.42 −.05 | 68.5 2.4 |
| July 8.4 | 22.08 .27 | 43.0 2.2 | 17.56 .39 | 71.2 2.3 | 22.85 −.02 | 61.7 0.5 | 39.32 .15 | 70.8 2.1 |
| 18.4 | 21.78 .32 | 45.0 1.8 | 17.13 .46 | 73.3 1.9 | 22.82 .05 | 61.3 0.5 | 39.13 .24 | 72.8 1.9 |
| 28.3 | 21.44 .37 | 46.7 1.4 | 16.64 .52 | 74.9 1.4 | 22.75 .09 | 60.8 0.4 | 38.86 .32 | 74.5 1.5 |
| Aug. 7.3 | 21.05 .41 | 47.8 0.9 | 16.09 .57 | 76.1 0.9 | 22.65 .11 | 60.5 0.4 | 38.50 .39 | 75.8 1.1 |
| 17.3 | 20.62 .44 | 48.5 +0.4 | 15.50 .61 | 76.8 +0.4 | 22.53 .13 | 60.1 0.3 | 38.08 .44 | 76.7 0.7 |
| 27.2 | 20.18 .45 | 48.6 −0.1 | 14.89 .63 | 77.0 −0.1 | 22.38 .15 | 59.9 0.3 | 37.62 .48 | 77.1 −0.2 |
| Sept. 6.2 | 19.72 .46 | 48.3 0.6 | 14.26 .63 | 76.7 0.6 | 22.23 .16 | 59.6 0.2 | 37.14 .49 | 77.1 +0.3 |
| 16.2 | 19.27 .44 | 47.4 1.1 | 13.63 .62 | 75.8 1.1 | 22.07 .15 | 59.5 0.1 | 36.65 .48 | 76.6 0.8 |
| 26.2 | 18.84 .42 | 46.0 1.7 | 13.03 .59 | 74.4 1.6 | 21.93 .14 | 59.4 +0.1 | 36.19 .45 | 75.6 1.2 |
| Oct. 6.1 | 18.44 .38 | 44.1 2.1 | 12.46 .54 | 72.5 2.1 | 21.80 .12 | 59.4 −0.1 | 35.77 .39 | 74.2 1.6 |
| 16.1 | 18.09 .33 | 41.8 2.6 | 11.95 .47 | 70.2 2.6 | 21.69 .09 | 59.5 0.2 | 35.42 .30 | 72.3 2.0 |
| 26.1 | 17.79 .26 | 39.0 3.0 | 11.52 .39 | 67.4 3.0 | 21.62 −.05 | 59.7 0.3 | 35.17 .20 | 70.2 2.3 |
| Nov. 5.1 | 17.56 .19 | 35.9 3.3 | 11.17 .30 | 64.3 3.3 | 21.60 .00 | 60.1 0.5 | 35.02 −.09 | 67.8 2.5 |
| 15.0 | 17.42 .10 | 32.5 3.5 | 10.93 .19 | 60.9 3.6 | 21.62 +.05 | 60.6 0.6 | 34.99 +.04 | 65.3 2.5 |
| 25.0 | 17.36 −.01 | 28.9 3.7 | 10.80 −.07 | 57.3 3.7 | 21.69 .10 | 61.3 0.8 | 35.09 .16 | 62.8 2.5 |
| Dec. 5.0 | 17.40 +.08 | 25.1 3.8 | 10.78 +.05 | 53.5 3.8 | 21.82 .15 | 62.1 0.9 | 35.31 .29 | 60.3 2.5 |
| 14.9 | 17.53 .17 | 21.3 3.7 | 10.89 .17 | 49.7 3.7 | 21.99 .19 | 63.2 1.1 | 35.66 .41 | 57.9 2.2 |
| 24.9 | 17.74 .26 | 17.7 3.6 | 11.11 .28 | 46.1 3.6 | 22.20 .23 | 64.3 1.2 | 36.12 .52 | 55.8 2.0 |
| 34.9 | 18.04 +.34 | 14.2 −3.3 | 11.45 +.39 | 42.6 −3.3 | 22.45 +.27 | 65.6 −1.2 | 36.69 +.61 | 54.0 +1.6 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *η* Herculis. | | *κ* Ophiuchi. | | *d* Herculis. | | **ε* Ursæ Minoris. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>16 38 | ° ′<br>+39 9 | h m<br>16 51 | ° ′<br>+9 33 | h m<br>16 57 | ° ′<br>+33 44 | h m<br>16 58 | ° ′<br>+82 13 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.9 | 37.34 +.23 | 18.7 −3.3 | 46.69 +.22 | 59.9 −2.2 | 0.15 +.21 | 43.5 −3.1 | 36.56+ .51 | 60.5 −3.4 |
| 10.9 | 37.60 .28 | 15.6 3.0 | 46.92 .25 | 57.7 2.1 | 0.38 .25 | 40.4 2.9 | 37.21 .80 | 57.2 3.2 |
| 20.9 | 37.90 .31 | 12.7 2.6 | 47.19 .28 | 55.7 2.0 | 0.65 .29 | 37.7 2.6 | 38.14 1.06 | 54.2 2.8 |
| 30.8 | 38.22 .34 | 10.3 2.2 | 47.48 .29 | 53.8 1.7 | 0.95 .31 | 35.2 2.2 | 39.31 1.28 | 51.7 2.3 |
| Feb. 9.8 | 38.56 .35 | 8.3 1.7 | 47.78 .30 | 52.2 1.4 | 1.27 .33 | 33.2 1.8 | 40.68 1.45 | 49.7 1.7 |
| 19.8 | 38.92 .36 | 6.9 1.1 | 48.08 .31 | 51.0 1.1 | 1.60 .34 | 31.7 1.2 | 42.18 1.56 | 48.4 1.1 |
| 29.8 | 39.28 .35 | 6.1 −0.5 | 48.39 .31 | 50.1 0.7 | 1.94 .34 | 30.7 0.7 | 43.78 1.61 | 47.5 −0.4 |
| Mar. 10.7 | 39.63 .34 | 5.9 +0.1 | 48.69 .30 | 49.6 −0.3 | 2.27 .33 | 30.3 −0.1 | 45.39 1.60 | 47.4 +0.2 |
| 20.7 | 39.96 .33 | 6.3 0.7 | 48.99 .29 | 49.5 +0.1 | 2.60 .32 | 30.5 +0.5 | 46.96 1.53 | 48.0 0.9 |
| 30.7 | 40.28 .30 | 7.3 1.2 | 49.27 .27 | 49.7 0.5 | 2.91 .30 | 31.3 1.0 | 48.43 1.41 | 49.2 1.5 |
| Apr. 9.6 | 40.57 .28 | 8.8 1.7 | 49.53 .26 | 50.4 0.8 | 3.19 .28 | 32.6 1.5 | 49.76 1.23 | 51.0 2.0 |
| 19.6 | 40.83 .24 | 10.7 2.1 | 49.78 .23 | 51.4 1.1 | 3.46 .25 | 34.3 1.9 | 50.89 1.02 | 53.2 2.5 |
| 29.6 | 41.05 .21 | 13.0 2.5 | 50.00 .21 | 52.6 1.3 | 3.69 .22 | 36.4 2.3 | 51.79 .78 | 55.8 2.8 |
| May 9.6 | 41.24 .17 | 15.6 2.7 | 50.20 .18 | 54.0 1.5 | 3.90 .19 | 38.8 2.5 | 52.44 .51 | 58.7 3.1 |
| 19.5 | 41.39 .13 | 18.3 2.8 | 50.37 .16 | 55.6 1.6 | 4.06 .15 | 41.3 2.7 | 52.82+ .23 | 61.9 3.2 |
| 29.5 | 41.49 .08 | 21.1 2.8 | 50.51 .12 | 57.2 1.7 | 4.19 .11 | 44.1 2.7 | 52.91− .05 | 65.1 3.2 |
| June 8.5 | 41.55 +.04 | 24.0 2.8 | 50.61 .09 | 58.9 1.7 | 4.28 .07 | 46.8 2.7 | 52.72 .33 | 68.3 3.1 |
| 18.5 | 41.57 −.01 | 26.7 2.7 | 50.69 .05 | 60.6 1.6 | 4.33 +.03 | 49.5 2.6 | 52.25 .60 | 71.3 3.0 |
| 28.4 | 41.54 .05 | 29.3 2.5 | 50.72 +.02 | 62.2 1.5 | 4.33 −.02 | 52.0 2.5 | 51.52 .86 | 74.2 2.8 |
| July 8.4 | 41.47 .09 | 31.6 2.2 | 50.72 −.02 | 63.6 1.4 | 4.29 .06 | 54.3 2.2 | 50.55 1.09 | 76.9 2.5 |
| 18.4 | 41.36 .13 | 33.7 1.9 | 50.68 .05 | 65.0 1.2 | 4.21 .10 | 56.4 2.0 | 49.36 1.30 | 79.1 2.1 |
| 28.3 | 41.20 .17 | 35.4 1.5 | 50.61 .09 | 66.1 1.0 | 4.10 .14 | 58.2 1.6 | 47.97 1.47 | 81.0 1.7 |
| Aug. 7.3 | 41.02 .20 | 36.7 1.1 | 50.51 .12 | 67.0 0.8 | 3.94 .17 | 59.6 1.3 | 46.42 1.62 | 82.5 1.3 |
| 17.3 | 40.81 .22 | 37.6 0.7 | 50.38 .14 | 67.7 0.6 | 3.76 .20 | 60.7 0.9 | 44.75 1.73 | 83.5 0.8 |
| 27.3 | 40.58 .24 | 38.1 +0.3 | 50.23 .16 | 68.2 0.4 | 3.56 .22 | 61.4 0.5 | 42.98 1.80 | 84.1 +0.3 |
| Sept. 6.2 | 40.34 .25 | 38.1 −0.2 | 50.07 .17 | 68.5 +0.1 | 3.34 .23 | 61.7 +0.1 | 41.16 1.83 | 84.1 −0.2 |
| 16.2 | 40.09 .24 | 37.7 0.6 | 49.90 .17 | 68.5 −0.1 | 3.11 .23 | 61.5 −0.4 | 39.33 1.82 | 83.6 0.7 |
| 26.2 | 39.86 .23 | 36.8 1.1 | 49.74 .16 | 68.2 0.4 | 2.89 .22 | 60.9 0.8 | 37.53 1.77 | 82.7 1.2 |
| Oct. 6.2 | 39.64 .21 | 35.5 1.5 | 49.59 .14 | 67.7 0.7 | 2.68 .20 | 59.9 1.2 | 35.80 1.68 | 81.2 1.7 |
| 16.1 | 39.44 .17 | 33.8 2.0 | 49.46 .12 | 66.9 0.9 | 2.50 .17 | 58.5 1.7 | 34.18 1.54 | 79.3 2.2 |
| 26.1 | 39.29 .13 | 31.6 2.3 | 49.36 .08 | 65.8 1.2 | 2.35 .13 | 56.6 2.0 | 32.72 1.37 | 76.9 2.6 |
| Nov. 5.1 | 39.18 .08 | 29.1 2.7 | 49.30 −.04 | 64.5 1.4 | 2.24 .09 | 54.4 2.4 | 31.46 1.15 | 74.1 2.9 |
| 15.0 | 39.13 −.03 | 26.3 3.0 | 49.29 +.01 | 63.0 1.7 | 2.18 −.03 | 51.9 2.7 | 30.43 .90 | 71.1 3.2 |
| 25.0 | 39.13 +.03 | 23.2 3.2 | 49.32 .06 | 61.2 1.9 | 2.17 +.02 | 49.1 2.9 | 29.67 .62 | 67.7 3.4 |
| Dec. 5.0 | 39.19 .09 | 19.9 3.3 | 49.40 .11 | 59.2 2.0 | 2.22 .07 | 46.1 3.1 | 29.19− .32 | 64.2 3.6 |
| 15.0 | 39.31 .15 | 16.6 3.4 | 49.53 .15 | 57.2 2.1 | 2.32 .13 | 42.9 3.2 | 29.03 .00 | 60.5 3.6 |
| 24.9 | 39.49 .21 | 13.2 3.3 | 49.71 .20 | 55.0 2.2 | 2.48 .18 | 39.7 3.2 | 29.19+ .31 | 57.0 3.5 |
| 34.9 | 39.72 +.26 | 10.0 −3.1 | 49.93 +.24 | 52.9 −2.1 | 2.68 +.23 | 36.6 −3.1 | 29.65+ .62 | 53.6 −3.3 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α¹ Herculis. | | 44 Ophiuchi. | | β Draconis. | | α Ophiuchi. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | 17h 8m | +14° 31′ | 17h 18m | −24° 3′ | 17h 27m | +52° 23′ | 17h 29m | +12° 38′ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.9 | 58.33 +.20 | 48.7 −2.4 | 46.42 +.24 | 37.4 −0.3 | 35.80 +.18 | 23.1 −3.6 | 9.37 +.19 | 56.3 −2.3 |
| 10.9 | 58.55 .24 | 46.3 2.3 | 46.68 .27 | 37.7 0.3 | 36.01 .24 | 19.7 3.4 | 9.57 .22 | 54.1 2.2 |
| 20.9 | 58.80 .27 | 44.1 2.1 | 46.96 .30 | 38.1 0.4 | 36.28 .30 | 16.5 3.1 | 9.81 .25 | 52.0 2.0 |
| 30.9 | 59.08 .29 | 42.1 1.9 | 47.27 .32 | 38.6 0.5 | 36.60 .34 | 13.6 2.6 | 10.07 .27 | 50.1 1.8 |
| Feb. 9.8 | 59.37 .30 | 40.4 1.5 | 47.59 .33 | 39.1 0.5 | 36.96 .38 | 11.2 2.1 | 10.35 .29 | 48.4 1.5 |
| 19.8 | 59.67 .31 | 39.1 1.2 | 47.93 .34 | 39.5 0.5 | 37.35 .40 | 9.4 1.5 | 10.65 .30 | 47.0 1.2 |
| 29.8 | 59.98 .31 | 38.1 0.7 | 48.27 .34 | 40.0 0.4 | 37.76 .42 | 8.2 0.9 | 10.95 .30 | 46.1 0.8 |
| Mar. 10.7 | 60.29 .30 | 37.6 −0.3 | 48.62 .34 | 40.4 0.4 | 38.17 .42 | 7.6 −0.2 | 11.25 .30 | 45.5 −0.3 |
| 20.7 | 60.59 .30 | 37.6 +0.2 | 48.95 .33 | 40.8 0.3 | 38.59 .41 | 7.6 +0.4 | 11.55 .30 | 45.4 +0.1 |
| 30.7 | 60.87 .28 | 37.9 0.6 | 49.28 .32 | 41.1 0.3 | 38.99 .39 | 8.4 1.0 | 11.85 .29 | 45.7 0.5 |
| Apr. 9.7 | 61.15 .27 | 38.7 1.0 | 49.59 .31 | 41.3 0.2 | 39.37 .37 | 9.7 1.6 | 12.13 .28 | 46.4 0.9 |
| 19.6 | 61.41 .25 | 39.8 1.3 | 49.89 .29 | 41.5 0.2 | 39.72 .33 | 11.6 2.1 | 12.40 .26 | 47.5 1.2 |
| 29.6 | 61.64 .22 | 41.3 1.6 | 50.17 .27 | 41.7 0.1 | 40.03 .29 | 13.9 2.5 | 12.65 .24 | 48.8 1.5 |
| May 9.6 | 61.85 .20 | 42.9 1.8 | 50.43 .25 | 41.8 0.1 | 40.30 .24 | 16.6 2.9 | 12.88 .22 | 50.4 1.7 |
| 19.6 | 62.04 .17 | 44.8 1.9 | 50.66 .22 | 41.9 0.1 | 40.51 .19 | 19.6 3.1 | 13.08 .19 | 52.2 1.9 |
| 29.5 | 62.19 .14 | 46.7 2.0 | 50.86 .18 | 42.0 0.1 | 40.68 .13 | 22.8 3.2 | 13.25 .16 | 54.1 1.9 |
| June 8.5 | 62.31 .10 | 48.7 2.0 | 51.02 .15 | 42.1 0.1 | 40.78 .08 | 26.1 3.3 | 13.39 .12 | 56.0 1.9 |
| 18.5 | 62.39 .07 | 50.7 1.9 | 51.15 .11 | 42.2 0.2 | 40.83 +.02 | 29.3 3.2 | 13.49 .09 | 58.0 1.9 |
| 28.4 | 62.44 +.03 | 52.5 1.8 | 51.24 .07 | 42.4 0.2 | 40.81 −.05 | 32.4 3.0 | 13.56 .05 | 59.8 1.8 |
| July 8.4 | 62.44 −.01 | 54.3 1.7 | 51.28 +.02 | 42.5 0.2 | 40.74 .10 | 35.3 2.8 | 13.58 +.01 | 61.6 1.7 |
| 18.4 | 62.41 .05 | 55.9 1.5 | 51.28 −.02 | 42.7 0.2 | 40.61 .16 | 38.0 2.5 | 13.57 −.03 | 63.2 1.5 |
| 28.4 | 62.35 .08 | 57.2 1.3 | 51.24 .06 | 42.9 0.2 | 40.42 .21 | 40.4 2.2 | 13.52 .07 | 64.6 1.3 |
| Aug. 7.3 | 62.25 .12 | 58.4 1.0 | 51.16 .10 | 43.0 0.1 | 40.19 .26 | 42.3 1.8 | 13.44 .10 | 65.8 1.1 |
| 17.3 | 62.12 .14 | 59.3 0.8 | 51.05 .13 | 43.1 −0.1 | 39.91 .29 | 43.9 1.3 | 13.32 .13 | 66.7 0.8 |
| 27.3 | 61.96 .16 | 59.9 0.5 | 50.91 .15 | 43.1 0.0 | 39.60 .32 | 45.0 0.9 | 13.18 .16 | 67.4 0.6 |
| Sept. 6.3 | 61.80 .17 | 60.2 +0.2 | 50.75 .17 | 43.1 +0.1 | 39.27 .34 | 45.6 +0.4 | 13.01 .17 | 67.8 +0.3 |
| 16.2 | 61.62 .18 | 60.3 −0.1 | 50.58 .17 | 42.9 0.2 | 38.92 .35 | 45.7 −0.1 | 12.84 .18 | 68.0 0.0 |
| 26.2 | 61.44 .17 | 60.0 0.4 | 50.41 .17 | 42.8 0.2 | 38.57 .34 | 45.3 0.7 | 12.66 .17 | 67.9 −0.3 |
| Oct. 6.2 | 61.28 .16 | 59.5 0.7 | 50.25 .15 | 42.5 0.3 | 38.24 .33 | 44.4 1.2 | 12.50 .16 | 67.5 0.6 |
| 16.1 | 61.14 .13 | 58.6 1.0 | 50.11 .12 | 42.2 0.3 | 37.92 .30 | 43.0 1.7 | 12.35 .14 | 66.7 0.9 |
| 26.1 | 61.02 .10 | 57.5 1.3 | 50.00 .09 | 41.9 0.3 | 37.64 .26 | 41.1 2.1 | 12.22 .11 | 65.8 1.1 |
| Nov. 5.1 | 60.94 .06 | 56.0 1.6 | 49.94 −.04 | 41.6 0.3 | 37.41 .21 | 38.8 2.6 | 12.13 .07 | 64.5 1.4 |
| 15.1 | 60.91 −.01 | 54.3 1.8 | 49.92 +.01 | 41.3 0.3 | 37.23 .14 | 36.0 2.9 | 12.08 −.03 | 63.0 1.7 |
| 25.0 | 60.92 +.04 | 52.4 2.1 | 49.95 .06 | 41.1 0.2 | 37.12 .08 | 33.0 3.2 | 12.08 +.02 | 61.2 1.9 |
| Dec. 5.0 | 60.98 .09 | 50.2 2.2 | 50.03 .11 | 41.0 +0.1 | 37.08 −.01 | 29.6 3.4 | 12.12 .07 | 59.2 2.1 |
| 15.0 | 61.09 .13 | 47.9 2.3 | 50.17 .16 | 41.0 0.0 | 37.11 +.06 | 26.1 3.6 | 12.21 .11 | 57.1 2.2 |
| 25.0 | 61.25 .18 | 45.6 2.4 | 50.35 .21 | 41.1 −0.2 | 37.20 .13 | 22.5 3.6 | 12.35 .16 | 54.9 2.2 |
| 34.9 | 61.44 +.21 | 43.2 −2.3 | 50.58 +.25 | 41.3 −0.2 | 37.37 +.20 | 19.0 −3.5 | 12.53 +.20 | 52.6 −2.2 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *ω Draconis. | | μ Herculis. | | *ψ¹ Draconis (*pr.*) | | γ Draconis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | $17^{h}\ 37^{m}$ | $+68^{\circ}\ 48'$ | $17^{h}\ 41^{m}$ | $+27^{\circ}\ 47'$ | $17^{h}\ 44^{m}$ | $+72^{\circ}\ 12'$ | $17^{h}\ 53^{m}$ | $+51^{\circ}\ 29'$ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 0.0 | 37.29 +.17 | 38.2 −3.7 | 34.87 +.17 | 29.1 −2.9 | 4.61 +.16 | 19.5 −3.6 | 41.63 +.13 | 62.2 −3.5 |
| 10.9 | 37.51 .28 | 34.6 3.5 | 35.06 .21 | 26.2 2.8 | 4.84 .29 | 15.9 3.5 | 41.80 .20 | 58.7 3.4 |
| 20.9 | 37.84 .38 | 31.3 3.1 | 35.28 .24 | 23.5 2.6 | 5.19 .41 | 12.6 3.2 | 42.03 .26 | 55.4 3.2 |
| 30.9 | 38.27 .47 | 28.3 2.7 | 35.54 .27 | 21.1 2.3 | 5.66 .52 | 9.6 2.8 | 42.31 .31 | 52.4 2.8 |
| Feb. 9.8 | 38.78 .55 | 25.8 2.2 | 35.82 .29 | 18.9 1.9 | 6.23 .61 | 7.1 2.3 | 42.64 .35 | 49.9 2.3 |
| 19.8 | 39.36 .60 | 23.9 1.6 | 36.12 .31 | 17.3 1.4 | 6.88 .68 | 5.1 1.7 | 43.00 .38 | 47.8 1.8 |
| 29.8 | 39.98 .63 | 22.6 1.0 | 36.44 .32 | 16.1 0.9 | 7.58 .73 | 3.6 1.1 | 43.39 .40 | 46.4 1.2 |
| Mar. 10.8 | 40.62 .65 | 21.9 −0.3 | 36.75 .32 | 15.4 −0.4 | 8.33 .75 | 2.9 −0.4 | 43.80 .41 | 45.5 −0.5 |
| 20.7 | 41.26 .64 | 22.0 +0.4 | 37.06 .32 | 15.3 +0.2 | 9.07 .74 | 2.9 +0.3 | 44.20 .41 | 45.3 +0.1 |
| 30.7 | 41.89 .61 | 22.7 1.0 | 37.37 .31 | 15.7 0.7 | 9.80 .72 | 3.5 0.9 | 44.61 .40 | 45.8 0.8 |
| Apr. 9.7 | 42.48 .57 | 24.0 1.6 | 37.68 .29 | 16.6 1.2 | 10.50 .67 | 4.7 1.5 | 45.00 .38 | 46.9 1.4 |
| 19.7 | 43.02 .51 | 25.9 2.2 | 37.96 .28 | 18.0 1.6 | 11.13 .59 | 6.5 2.1 | 45.36 .35 | 48.5 1.9 |
| 29.6 | 43.49 .43 | 28.3 2.6 | 38.23 .25 | 19.7 2.0 | 11.68 .51 | 8.8 2.5 | 45.69 .32 | 50.7 2.4 |
| May 9.6 | 43.88 .35 | 31.0 3.0 | 38.46 .22 | 21.8 2.2 | 12.14 .41 | 11.5 2.9 | 45.99 .27 | 53.3 2.8 |
| 19.6 | 44.18 .25 | 34.1 3.2 | 38.67 .19 | 24.2 2.5 | 12.49 .30 | 14.6 3.2 | 46.24 .22 | 56.2 3.0 |
| 29.5 | 44.39 .16 | 37.4 3.3 | 38.85 .16 | 26.7 2.6 | 12.73 .18 | 17.8 3.3 | 46.44 .17 | 59.3 3.2 |
| June 8.5 | 44.49 +.05 | 40.8 3.4 | 38.99 .12 | 29.3 2.6 | 12.85 +.06 | 21.2 3.4 | 46.58 .12 | 62.5 3.3 |
| 18.5 | 44.49 −.05 | 44.2 3.3 | 39.09 .08 | 31.9 2.6 | 12.85 −.07 | 24.5 3.3 | 46.67 +.06 | 65.8 3.3 |
| 28.5 | 44.39 .15 | 47.4 3.2 | 39.15 +.04 | 34.5 2.5 | 12.72 .19 | 27.8 3.2 | 46.69 −.01 | 69.1 3.2 |
| July 8.4 | 44.19 .25 | 50.5 3.0 | 39.16 −.01 | 36.9 2.3 | 12.47 .30 | 30.9 3.0 | 46.66 .07 | 72.2 3.0 |
| 18.4 | 43.90 .34 | 53.4 2.7 | 39.13 .05 | 39.1 2.1 | 12.12 .41 | 33.8 2.7 | 46.56 .12 | 75.0 2.7 |
| 28.4 | 43.51 .42 | 55.9 2.3 | 39.06 .09 | 41.1 1.8 | 11.66 .51 | 36.3 2.4 | 46.41 .18 | 77.6 2.4 |
| Aug. 7.4 | 43.05 .50 | 58.0 1.9 | 38.96 .13 | 42.7 1.5 | 11.11 .60 | 38.5 2.0 | 46.21 .23 | 79.9 2.1 |
| 17.3 | 42.53 .56 | 59.7 1.5 | 38.81 .16 | 44.1 1.2 | 10.47 .67 | 40.3 1.6 | 45.96 .27 | 81.7 1.7 |
| 27.3 | 41.94 .60 | 61.0 1.0 | 38.64 .18 | 45.1 0.8 | 9.78 .72 | 41.6 1.1 | 45.68 .30 | 83.1 1.2 |
| Sept. 6.3 | 41.33 .63 | 61.7 +0.5 | 38.45 .20 | 45.7 0.5 | 9.03 .76 | 42.4 +0.6 | 45.36 .33 | 84.1 0.7 |
| 16.2 | 40.68 .65 | 62.0 0.0 | 38.24 .21 | 46.0 +0.1 | 8.26 .78 | 42.7 0.0 | 45.02 .34 | 84.6 +0.2 |
| 26.2 | 40.04 .64 | 61.7 −0.6 | 38.03 .21 | 45.9 −0.3 | 7.48 .78 | 42.5 −0.5 | 44.68 .34 | 84.5 −0.3 |
| Oct. 6.2 | 39.40 .62 | 60.8 1.1 | 37.82 .20 | 45.3 0.7 | 6.71 .76 | 41.8 1.0 | 44.34 .33 | 84.0 0.8 |
| 16.2 | 38.80 .58 | 59.5 1.6 | 37.64 .18 | 44.4 1.1 | 5.97 .71 | 40.5 1.5 | 44.02 .31 | 82.9 1.3 |
| 26.1 | 38.25 .52 | 57.6 2.1 | 37.47 .15 | 43.1 1.5 | 5.29 .65 | 38.8 2.0 | 43.73 .27 | 81.4 1.8 |
| Nov. 5.1 | 37.76 .45 | 55.3 2.5 | 37.34 .11 | 41.3 1.9 | 4.68 .56 | 36.5 2.5 | 43.48 .23 | 79.4 2.2 |
| 15.1 | 37.35 .36 | 52.6 2.9 | 37.25 .07 | 39.3 2.2 | 4.17 .46 | 33.8 2.9 | 43.28 .17 | 76.9 2.7 |
| 25.1 | 37.05 .25 | 49.5 3.3 | 37.21 −.02 | 37.0 2.5 | 3.76 .34 | 30.8 3.2 | 43.14 .11 | 74.1 3.0 |
| Dec. 5.0 | 36.85 .14 | 46.1 3.5 | 37.22 +.03 | 34.4 2.7 | 3.49 .21 | 27.5 3.5 | 43.06 −.04 | 70.9 3.3 |
| 15.0 | 36.77 −.02 | 42.5 3.6 | 37.28 .08 | 31.6 2.8 | 3.34 −.07 | 23.9 3.6 | 43.05 +.03 | 67.5 3.4 |
| 25.0 | 36.80 +.10 | 38.9 3.7 | 37.39 .13 | 28.7 2.9 | 3.34 +.07 | 20.3 3.7 | 43.11 .09 | 64.1 3.5 |
| 34.9 | 36.96 +.22 | 35.3 −3.6 | 37.55 +.19 | 25.8 −2.9 | 3.48 +.20 | 16.7 −3.6 | 43.24 +.16 | 60.5 −3.5 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | $\gamma^2$ Sagittarii. | | $\mu^1$ Sagittarii. | | *$\sigma$ Octantis. | |
|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* |
| | h m | ° ′ | h m | ° ′ | h | ° ′ |
| | 17 57 | −30 25 | 18 6 | −21 5 | 18 | −89 16 |
| | s | ″ | s | ″ | m s | ″ |
| Jan. 0.0 | 48.99 +.21 | 32.2 +0.3 | 19.39 +.19 | 29.4 −0.2 | 15 27.98 + 6.68 | 43.4 +3.8 |
| 10.9 | 49.22 .25 | 31.9 0.3 | 19.60 .22 | 29.6 0.3 | 15 36.25 9.80 | 40.2 3.1 |
| 20.9 | 49.48 .28 | 31.6 0.2 | 19.83 .25 | 29.9 0.3 | 15 47.49 12.63 | 37.2 2.8 |
| 30.9 | 49.78 .31 | 31.5 0.1 | 20.10 .28 | 30.1 0.3 | 16 1.39 15.11 | 34.5 2.5 |
| Feb. 9.9 | 50.10 .33 | 31.4 +0.1 | 20.39 .30 | 30.4 0.2 | 16 17.57 17.16 | 32.2 2.1 |
| 19.9 | 50.43 .35 | 31.4 0.0 | 20.70 .32 | 30.6 0.2 | 16 35.57 18.77 | 30.3 1.7 |
| 29.8 | 50.78 .35 | 31.4 0.0 | 21.02 .33 | 30.8 −0.1 | 16 54.94 19.92 | 28.8 1.3 |
| Mar. 10.8 | 51.14 .36 | 31.4 0.0 | 21.34 .33 | 30.8 0.0 | 17 15.24 20.61 | 27.8 0.8 |
| 20.7 | 51.50 .36 | 31.4 0.0 | 21.67 .33 | 30.8 +0.1 | 17 36.01 20.86 | 27.4 +0.2 |
| 30.7 | 51.85 .35 | 31.4 0.0 | 22.00 .33 | 30.7 0.1 | 17 56.81 20.68 | 27.4 −0.3 |
| Apr. 9.7 | 52.20 .34 | 31.5 −0.1 | 22.33 .32 | 30.5 0.2 | 18 17.23 20.11 | 27.8 0.7 |
| 19.7 | 52.54 .33 | 31.6 0.1 | 22.64 .31 | 30.3 0.3 | 18 36.88 19.14 | 28.7 1.2 |
| 29.6 | 52.86 .31 | 31.6 0.1 | 22.95 .30 | 30.0 0.3 | 18 55.36 17.77 | 30.1 1.6 |
| May 9.6 | 53.16 .29 | 31.8 0.2 | 23.23 .28 | 29.7 0.3 | 19 12.27 16.03 | 32.0 1.9 |
| 19.6 | 53.44 .26 | 32.0 0.2 | 23.49 .25 | 29.3 0.3 | 19 27.28 13.96 | 34.1 2.2 |
| 29.6 | 53.69 .23 | 32.2 0.3 | 23.73 .22 | 29.0 0.3 | 19 40.08 11.59 | 36.6 2.5 |
| June 8.5 | 53.90 .20 | 32.5 0.3 | 23.94 .19 | 28.7 0.2 | 19 50.37 8.96 | 39.3 2.8 |
| 18.5 | 54.07 .15 | 32.9 0.4 | 24.11 .15 | 28.6 0.2 | 19 57.93 6.13 | 42.3 3.0 |
| 28.5 | 54.21 .11 | 33.3 0.5 | 24.24 .11 | 28.4 0.1 | 20 2.58 3.15 | 45.3 3.1 |
| July 8.4 | 54.29 .06 | 33.8 0.5 | 24.33 .07 | 28.3 +0.1 | 20 4.21 + 0.10 | 48.4 3.0 |
| 18.4 | 54.33 +.01 | 34.3 0.5 | 24.37 +.02 | 28.3 0.0 | 20 2.78 − 2.95 | 51.4 2.9 |
| 28.4 | 54.32 −.03 | 34.8 0.5 | 24.37 −.02 | 28.3 −0.1 | 19 58.35 5.90 | 54.2 2.7 |
| Aug. 7.4 | 54.26 .08 | 35.3 0.5 | 24.33 .06 | 28.4 0.1 | 19 51.05 8.65 | 56.8 2.4 |
| 17.3 | 54.17 .12 | 35.7 0.4 | 24.24 .10 | 28.5 0.1 | 19 41.14 11.11 | 59.1 2.1 |
| 27.3 | 54.04 .15 | 36.1 0.3 | 24.13 .13 | 28.6 0.1 | 19 28.95 13.19 | 61.0 1.7 |
| Sept. 6.3 | 53.88 .17 | 36.3 0.2 | 23.98 .16 | 28.6 −0.1 | 19 14.92 14.78 | 62.4 1.2 |
| 16.3 | 53.70 .18 | 36.4 −0.1 | 23.82 .17 | 28.7 0.0 | 18 59.58 15.81 | 63.3 −0.6 |
| 26.2 | 53.51 .19 | 36.4 +0.1 | 23.65 .17 | 28.7 0.0 | 18 43.51 16.23 | 63.5 0.0 |
| Oct. 6.2 | 53.33 .18 | 36.3 0.2 | 23.48 .16 | 28.7 +0.1 | 18 27.33 16.00 | 63.2 +0.6 |
| 16.2 | 53.17 .15 | 36.0 0.3 | 23.33 .15 | 28.6 0.1 | 18 11.72 15.10 | 62.3 1.2 |
| 26.1 | 53.03 .12 | 35.6 0.4 | 23.20 .12 | 28.5 0.1 | 17 57.35 13.54 | 60.8 1.7 |
| Nov. 5.1 | 52.92 .08 | 35.1 0.5 | 23.10 .08 | 28.4 0.1 | 17 44.85 11.38 | 58.8 2.2 |
| 15.1 | 52.87 −.03 | 34.6 0.6 | 23.04 −.04 | 28.3 0.1 | 17 34.75 8.74 | 56.3 2.7 |
| 25.1 | 52.86 +.02 | 34.0 0.6 | 23.02 +.01 | 28.2 +0.1 | 17 27.50 5.71 | 53.4 3.0 |
| Dec. 5.0 | 52.91 .07 | 33.5 0.5 | 23.06 .06 | 28.2 0.0 | 17 23.42 − 2.42 | 50.2 3.2 |
| 15.0 | 53.01 .13 | 33.0 0.5 | 23.14 .11 | 28.2 −0.1 | 17 22.71 + 1.01 | 46.9 3.3 |
| 25.0 | 53.16 .18 | 32.5 0.4 | 23.28 .16 | 28.3 0.1 | 17 25.43 4.42 | 43.5 3.3 |
| 35.0 | 53.36 +.23 | 32.1 +0.3 | 23.45 +.20 | 28.5 −0.2 | 17 31.52 + 7.67 | 40.2 +3.2 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | η Serpentis. | | 1 Aquilæ. | | α Lyræ. (*Vega.*) | | β Lyræ. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>18 14 | ° ′<br>−2 55 | h m<br>18 28 | ° ′<br>−8 19 | h m<br>18 32 | ° ′<br>+38 39 | h m<br>18 45 | ° ′<br>+33 12 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.0 | 52.17 +.15 | 53.9 −1.3 | 26.10 +.15 | 53.0 −0.9 | 42.58 +.10 | 59.7 −3.1 | 28.38 +.09 | 62.3 −3.0 |
| 10.9 | 52.34 .19 | 55.2 1.3 | 26.27 .18 | 53.9 0.9 | 42.70 .15 | 56.6 3.1 | 28.49 .13 | 59.3 2.9 |
| 20.9 | 52.55 .22 | 56.5 1.2 | 26.47 .22 | 54.8 0.9 | 42.87 .19 | 53.5 3.0 | 28.65 .18 | 56.4 2.8 |
| 30.9 | 52.78 .25 | 57.7 1.1 | 26.70 .24 | 55.7 0.8 | 43.09 .23 | 50.7 2.7 | 28.84 .22 | 53.8 2.6 |
| Feb. 9.9 | 53.04 .27 | 58.7 1.0 | 26.95 .27 | 56.4 0.7 | 43.34 .27 | 48.2 2.3 | 29.08 .25 | 51.4 2.2 |
| 19.8 | 53.31 .28 | 59.6 0.7 | 27.23 .28 | 57.0 0.5 | 43.62 .30 | 46.1 1.9 | 29.34 .28 | 49.3 1.8 |
| 29.8 | 53.60 .29 | 60.2 0.5 | 27.51 .30 | 57.4 0.3 | 43.93 .32 | 44.5 1.4 | 29.63 .30 | 47.7 1.3 |
| Mar. 10.8 | 53.90 .30 | 60.5 −0.2 | 27.81 .30 | 57.6 −0.1 | 44.26 .34 | 43.4 0.8 | 29.94 .32 | 46.7 0.8 |
| 20.8 | 54.20 .30 | 60.6 +0.1 | 28.12 .31 | 57.6 +0.1 | 44.60 .34 | 42.9 −0.2 | 30.26 .33 | 46.1 −0.2 |
| 30.7 | 54.50 .30 | 60.4 0.3 | 28.43 .31 | 57.3 0.4 | 44.94 .35 | 43.1 +0.4 | 30.58 .33 | 46.2 +0.4 |
| Apr. 9.7 | 54.80 .30 | 60.0 0.6 | 28.73 .31 | 56.9 0.6 | 45.29 .34 | 43.8 1.0 | 30.91 .33 | 46.8 0.9 |
| 19.7 | 55.09 .29 | 59.3 0.8 | 29.04 .30 | 56.2 0.7 | 45.62 .33 | 45.1 1.5 | 31.24 .32 | 48.0 1.4 |
| 29.6 | 55.37 .27 | 58.4 1.0 | 29.33 .29 | 55.4 0.9 | 45.94 .31 | 46.8 2.0 | 31.55 .30 | 49.6 1.9 |
| May 9.6 | 55.64 .26 | 57.3 1.1 | 29.61 .27 | 54.5 1.0 | 46.23 .28 | 49.0 2.4 | 31.84 .28 | 51.7 2.2 |
| 19.6 | 55.88 .23 | 56.1 1.2 | 29.87 .25 | 53.5 1.0 | 46.50 .25 | 51.6 2.7 | 32.11 .25 | 54.1 2.5 |
| 29.6 | 56.10 .21 | 54.9 1.3 | 30.10 .22 | 52.4 1.1 | 46.73 .21 | 54.4 2.9 | 32.35 .22 | 56.8 2.8 |
| June 8.5 | 56.29 .18 | 53.6 1.3 | 30.31 .19 | 51.3 1.0 | 46.92 .17 | 57.4 3.1 | 32.55 .19 | 59.6 2.9 |
| 18.5 | 56.45 .14 | 52.3 1.2 | 30.49 .16 | 50.3 1.0 | 47.07 .13 | 60.5 3.1 | 32.71 .14 | 62.6 3.0 |
| 28.5 | 56.57 .10 | 51.1 1.2 | 30.63 .12 | 49.4 0.9 | 47.17 .08 | 63.6 3.1 | 32.83 .10 | 65.5 2.9 |
| July 8.5 | 56.65 .06 | 50.0 1.1 | 30.72 .08 | 48.5 0.8 | 47.22 +.02 | 66.6 3.0 | 32.91 +.05 | 68.4 2.8 |
| 18.4 | 56.69 +.02 | 49.0 1.0 | 30.78 +.04 | 47.7 0.7 | 47.22 −.03 | 69.5 2.8 | 32.93 .00 | 71.2 2.7 |
| 28.4 | 56.69 −.02 | 48.1 0.8 | 30.79 −.01 | 47.1 0.6 | 47.17 .08 | 72.2 2.5 | 32.91 −.05 | 73.7 2.5 |
| Aug. 7.4 | 56.65 .06 | 47.3 0.7 | 30.77 .05 | 46.5 0.5 | 47.07 .12 | 74.5 2.2 | 32.84 .09 | 76.0 2.2 |
| 17.3 | 56.57 .10 | 46.7 0.5 | 30.70 .09 | 46.1 0.4 | 46.93 .16 | 76.6 1.9 | 32.72 .13 | 78.1 1.9 |
| 27.3 | 56.46 .13 | 46.3 0.4 | 30.60 .12 | 45.8 0.3 | 46.75 .20 | 78.3 1.5 | 32.57 .17 | 79.8 1.5 |
| Sept. 6.3 | 56.32 .15 | 46.0 0.3 | 30.47 .14 | 45.7 0.2 | 46.53 .23 | 79.6 1.1 | 32.39 .20 | 81.1 1.1 |
| 16.3 | 56.17 .16 | 45.8 +0.1 | 30.32 .16 | 45.5 +0.1 | 46.30 .24 | 80.5 0.7 | 32.18 .22 | 82.0 0.7 |
| 26.2 | 56.00 .17 | 45.7 0.0 | 30.16 .16 | 45.5 0.0 | 46.05 .25 | 80.9 +0.2 | 31.96 .23 | 82.5 +0.3 |
| Oct. 6.2 | 55.84 .16 | 45.9 −0.2 | 30.00 .16 | 45.6 −0.1 | 45.80 .25 | 80.9 −0.3 | 31.73 .23 | 82.6 −0.1 |
| 16.2 | 55.68 .15 | 46.1 0.4 | 29.84 .15 | 45.8 0.2 | 45.55 .24 | 80.4 0.7 | 31.50 .22 | 82.2 0.6 |
| 26.2 | 55.55 .12 | 46.6 0.5 | 29.70 .12 | 46.0 0.3 | 45.32 .22 | 79.4 1.2 | 31.30 .20 | 81.4 1.0 |
| Nov. 5.1 | 55.45 .09 | 47.1 0.6 | 29.60 .09 | 46.4 0.4 | 45.12 .18 | 78.0 1.6 | 31.11 .17 | 80.2 1.5 |
| 15.1 | 55.38 .05 | 47.9 0.8 | 29.52 .05 | 46.9 0.5 | 44.96 .14 | 76.1 2.1 | 30.96 .13 | 78.5 1.8 |
| 25.1 | 55.35 −.01 | 48.7 0.9 | 29.49 −.01 | 47.5 0.6 | 44.84 .10 | 73.9 2.4 | 30.85 .09 | 76.5 2.2 |
| Dec. 5.0 | 55.37 +.04 | 49.7 1.1 | 29.50 +.03 | 48.1 0.7 | 44.77 −.04 | 71.3 2.7 | 30.79 −.04 | 74.2 2.5 |
| 15.0 | 55.43 .08 | 50.8 1.2 | 29.55 .08 | 48.9 0.8 | 44.75 +.01 | 68.5 2.9 | 30.77 .00 | 71.6 2.7 |
| 25.0 | 55.53 .13 | 52.0 1.2 | 29.65 .12 | 49.7 0.9 | 44.79 .06 | 65.4 3.1 | 30.79 +.05 | 68.8 2.9 |
| 35.0 | 55.63 +.17 | 53.3 −1.3 | 29.79 +.16 | 50.6 −0.9 | 44.88 +.12 | 62.3 −3.2 | 30.87 +.10 | 65.9 −2.9 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | σ Sagittarii. |  | *50 Draconis. |  | ζ Aquilæ. |  | *d* Sagittarii. |  |
|---|---|---|---|---|---|---|---|---|
|  | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
|  | h m<br>18 47 | ° ′<br>−26 26 | h m<br>18 50 | ° ′<br>+75 16 | h m<br>18 59 | ° ′<br>+13 40 | h m<br>19 10 | ° ′<br>−19 10 |
|  | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.0 | 33.07 +.15 | 63.9 +0.3 | 15.91 −.09 | 63.1 −3.5 | 41.11 +.10 | 41.8 −2.1 | 21.33 +.12 | 25.1 −0.1 |
| 10.9 | 33.24 .19 | 63.6 0.3 | 15.90 +.08 | 59.5 3.5 | 41.22 .13 | 39.8 2.0 | 21.46 .15 | 25.2 −0.1 |
| 20.9 | 33.45 .22 | 63.4 0.3 | 16.06 .24 | 56.1 3.4 | 41.37 .17 | 37.8 2.0 | 21.63 .19 | 25.2 0.0 |
| 30.9 | 33.68 .26 | 63.1 0.3 | 16.38 .40 | 52.8 3.2 | 41.56 .20 | 36.0 1.8 | 21.84 .22 | 25.3 0.0 |
| Feb. 9.9 | 33.95 .28 | 62.8 0.3 | 16.85 .54 | 49.8 2.8 | 41.77 .23 | 34.2 1.6 | 22.07 .25 | 25.2 0.0 |
| 19.9 | 34.25 .30 | 62.5 0.3 | 17.44 .66 | 47.1 2.4 | 42.01 .25 | 32.8 1.3 | 22.33 .27 | 25.1 +0.2 |
| 29.8 | 34.56 .32 | 62.2 0.3 | 18.15 .76 | 45.0 1.8 | 42.28 .27 | 31.7 0.9 | 22.61 .29 | 24.9 0.3 |
| Mar. 10.8 | 34.88 .33 | 61.8 0.4 | 18.94 .83 | 43.5 1.2 | 42.55 .29 | 31.0 0.5 | 22.91 .30 | 24.6 0.4 |
| 20.8 | 35.22 .34 | 61.4 0.4 | 18.79 .87 | 42.6 −0.6 | 42.84 .30 | 30.8 −0.1 | 23.22 .32 | 24.1 0.5 |
| 30.8 | 35.56 .34 | 61.0 0.4 | 20.67 .88 | 42.4 +0.1 | 43.14 .30 | 31.0 +0.4 | 23.54 .32 | 23.6 0.6 |
| Apr. 9.7 | 35.91 .34 | 60.5 0.5 | 21.54 .86 | 42.8 0.8 | 43.45 .30 | 31.5 0.8 | 23.86 .33 | 22.9 0.7 |
| 19.7 | 36.25 .34 | 60.1 0.5 | 22.38 .82 | 43.9 1.4 | 43.75 .30 | 32.5 1.1 | 24.19 .33 | 22.2 0.8 |
| 29.7 | 36.58 .33 | 59.6 0.5 | 23.17 .75 | 45.5 1.9 | 44.04 .29 | 33.9 1.5 | 24.51 .32 | 21.4 0.8 |
| May 9.6 | 36.90 .31 | 59.2 0.4 | 23.87 .66 | 47.7 2.4 | 44.33 .28 | 35.5 1.8 | 24.83 .31 | 20.6 0.8 |
| 19.6 | 37.21 .29 | 58.8 0.3 | 24.47 .54 | 50.3 2.8 | 44.59 .26 | 37.4 2.0 | 25.13 .29 | 19.8 0.8 |
| 29.6 | 37.49 .27 | 58.5 0.2 | 24.95 .42 | 53.2 3.1 | 44.84 .23 | 39.5 2.1 | 25.41 .27 | 19.0 0.7 |
| June 8.6 | 37.74 .24 | 58.3 +0.2 | 25.30 .28 | 56.5 3.3 | 45.06 .20 | 41.6 2.2 | 25.67 .24 | 18.3 0.7 |
| 18.5 | 37.96 .20 | 58.2 0.0 | 25.50 +.13 | 59.9 3.4 | 45.24 .17 | 43.9 2.2 | 25.89 .21 | 17.7 0.6 |
| 28.5 | 38.13 .16 | 58.3 −0.1 | 25.56 −.02 | 63.3 3.5 | 45.39 .13 | 46.1 2.2 | 26.08 .17 | 17.2 0.5 |
| July 8.5 | 38.27 .11 | 58.4 0.2 | 25.47 .16 | 66.8 3.4 | 45.50 .09 | 48.2 2.1 | 26.23 .13 | 16.8 0.3 |
| 18.5 | 38.35 .06 | 58.6 0.3 | 25.24 .31 | 70.1 3.3 | 45.56 +.04 | 50.2 2.0 | 26.33 .08 | 16.5 0.2 |
| 28.4 | 38.39 +.01 | 58.9 0.3 | 24.86 .44 | 73.3 3.1 | 45.58 .00 | 52.1 1.8 | 26.39 +.03 | 16.3 +0.1 |
| Aug. 7.4 | 38.38 −.03 | 59.3 0.4 | 24.36 .57 | 76.2 2.8 | 45.56 −.04 | 53.8 1.6 | 26.40 −.01 | 16.3 0.0 |
| 17.4 | 38.33 .08 | 59.7 0.4 | 23.73 .68 | 78.9 2.4 | 45.50 .08 | 55.2 1.3 | 26.36 .06 | 16.4 −0.1 |
| 27.4 | 38.23 .11 | 60.0 0.4 | 23.00 .78 | 81.1 2.1 | 45.40 .12 | 56.4 1.1 | 26.29 .10 | 16.5 0.1 |
| Sept. 6.3 | 38.10 .14 | 60.4 0.3 | 22.18 .86 | 82.9 1.6 | 45.27 .14 | 57.3 0.8 | 26.18 .13 | 16.7 0.2 |
| 16.3 | 37.94 .17 | 60.7 0.3 | 21.30 .91 | 84.3 1.1 | 45.12 .16 | 58.0 +0.5 | 26.04 .15 | 16.9 0.2 |
| 26.3 | 37.77 .18 | 60.9 0.2 | 20.37 .95 | 85.2 0.6 | 44.95 .18 | 58.3 0.0 | 25.88 .16 | 17.1 0.2 |
| Oct. 6.2 | 37.59 .18 | 61.1 −0.1 | 19.42 .96 | 85.6 +0.1 | 44.77 .18 | 58.4 −0.1 | 25.72 .17 | 17.3 0.2 |
| 16.2 | 37.42 .17 | 61.1 0.0 | 18.46 .94 | 85.4 −0.4 | 44.59 .17 | 58.2 0.4 | 25.55 .16 | 17.4 0.1 |
| 26.2 | 37.27 .14 | 61.0 +0.1 | 17.54 .90 | 84.7 1.0 | 44.43 .15 | 57.6 0.7 | 25.40 .14 | 17.5 0.1 |
| Nov. 5.2 | 37.14 .11 | 60.8 0.2 | 16.67 .84 | 83.4 1.5 | 44.29 .13 | 56.8 1.0 | 25.27 .12 | 17.6 0.1 |
| 15.1 | 37.05 .07 | 60.6 0.3 | 15.88 .75 | 81.7 2.0 | 44.18 .09 | 55.7 1.2 | 25.17 .08 | 17.7 0.1 |
| 25.1 | 37.00 −.03 | 60.3 0.3 | 15.19 .63 | 79.4 2.5 | 44.11 .06 | 54.3 1.5 | 25.10 −.04 | 17.8 0.1 |
| Dec. 5.1 | 36.99 +.02 | 60.0 0.3 | 14.62 .50 | 76.8 2.9 | 44.07 −.02 | 52.8 1.7 | 25.08 .00 | 17.8 0.1 |
| 15.0 | 37.04 .07 | 59.6 0.3 | 14.19 .36 | 73.7 3.2 | 44.08 +.03 | 51.0 1.9 | 25.10 +.04 | 17.9 0.1 |
| 25.0 | 37.13 .12 | 59.3 0.3 | 13.91 .20 | 70.4 3.4 | 44.12 .07 | 49.1 2.0 | 25.17 .09 | 18.0 0.1 |
| 35.0 | 37.27 +.16 | 59.0 +0.3 | 13.80 −.03 | 67.0 −3.5 | 44.21 +.11 | 47.0 −2.1 | 25.28 +.13 | 18.0 −0.1 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *δ Draconis. | | *τ Draconis. | | δ Aquilæ. | | κ Aquilæ. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
| | h m<br>19 12 | ° ′<br>+67 26 | h m<br>19 17 | ° ′<br>+73 7 | h m<br>19 19 | ° ′<br>+2 51 | h m<br>19 30 | ° ′<br>−7 18 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.0 | 27.37 −.07 | 29.6 −3.4 | 50.37 −.15 | 22.8 −3.4 | 13.33 + 09 | 60.4 −1.4 | 11.82 +.09 | 13.5 −0.8 |
| 11.0 | 27.35 +.04 | 26.1 3.5 | 50.29 −.01 | 19.4 3.5 | 13.44 .13 | 59.0 1.4 | 11.92 .12 | 14.3 0.8 |
| 21.0 | 27.45 .15 | 22.6 3.5 | 50.35 +.14 | 15.9 3.5 | 13.58 .16 | 57.6 1.3 | 12.06 .16 | 15.0 0.7 |
| 30.9 | 27.65 .25 | 19.2 3.3 | 50.55 .28 | 12.5 3.3 | 13.76 .20 | 56.4 1.2 | 12.23 .19 | 15.7 0.6 |
| Feb. 9.9 | 27.94 .34 | 16.1 3.0 | 50.89 .41 | 9.3 3.0 | 13.96 .22 | 55.2 1.0 | 12.43 .22 | 16.2 0.5 |
| 19.9 | 28.33 .43 | 13.4 2.5 | 51.36 .52 | 6.5 2.6 | 14.19 .24 | 54.3 0.8 | 12.66 .24 | 16.6 0.3 |
| 29.9 | 28.79 .50 | 11.1 2.0 | 51.93 .62 | 4.2 2.1 | 14.44 .26 | 53.7 0.5 | 12.91 .26 | 16.8 −0.1 |
| Mar. 10.8 | 29.32 .55 | 9.3 1.4 | 52.58 .69 | 2.4 1.5 | 14.71 .28 | 53.3 −0.2 | 13.18 .28 | 16.8 +0.1 |
| 20.8 | 29.89 .59 | 8.2 0.8 | 53.31 .75 | 1.1 0.9 | 14.99 .29 | 53.3 +0.1 | 13.47 .29 | 16.5 0.4 |
| 30.8 | 30.49 .61 | 7.7 −0.1 | 54.07 .77 | 0.6 −0.2 | 15.28 .30 | 53.6 0.5 | 13.76 .30 | 16.0 0.6 |
| Apr. 9.7 | 31.10 .61 | 7.9 +0.5 | 54.85 .78 | 0.7 +0.4 | 15.58 .30 | 54.2 0.8 | 14.07 .31 | 15.3 0.8 |
| 19.7 | 31.70 .58 | 8.8 1.2 | 55.61 .75 | 1.4 1.1 | 15.89 .30 | 55.1 1.1 | 14.38 .31 | 14:4 1.0 |
| 29.7 | 32.27 .56 | 10.2 1.8 | 56.34 .71 | 2.7 1.6 | 16.19 .30 | 56.3 1.3 | 14.69 .31 | 13.3 1.2 |
| May 9.7 | 32.80 .51 | 12.2 2.3 | 57.02 .64 | 4.7 2.2 | 16.48 .29 | 57.7 1.5 | 14.99 .30 | 12.1 1.3 |
| 19.6 | 33.28 .44 | 14.7 2.7 | 57.62 .56 | 7.1 2.6 | 16.76 .27 | 59.3 1.7 | 15.29 .29 | 10.7 1.4 |
| 29.6 | 33.68 .37 | 17.6 3.1 | 58.13 .46 | 9.9 3.0 | 17.03 .25 | 61.1 1.8 | 15.56 .27 | 9.4 1.4 |
| June 8.6 | 34.00 .28 | 20.8 3.3 | 58.53 .34 | 13.0 3.3 | 17.26 .23 | 62.8 1.8 | 15.82 .24 | 8.0 1.4 |
| 18.6 | 34.24 .19 | 24.2 3.5 | 58.81 .22 | 16.4 3.4 | 17.47 .19 | 64.6 1.8 | 16.04 .21 | 6.7 1.3 |
| 28.5 | 34.38 +.09 | 27.8 3.6 | 58.97 +.09 | 19.9 3.5 | 17.65 .16 | 66.4 1.7 | 16.24 .17 | 5.5 1.2 |
| July 8.5 | 34.42 −.01 | 31.3 3.5 | 58.99 −.04 | 23.4 3.5 | 17.78 .12 | 68.0 1.6 | 16.39 .13 | 4.3 1.1 |
| 18.5 | 34.36 .11 | 34.8 3.4 | 58.89 .17 | 26.9 3.5 | 17.88 .07 | 69.6 1.5 | 16.50 .09 | 3.3 0.9 |
| 28.5 | 34.20 .20 | 38.1 3.3 | 58.66 .29 | 30.3 3.3 | 17.93 +.03 | 71.0 1.3 | 16.57 +.05 | 2.4 0.8 |
| Aug. 7.4 | 33.95 .30 | 41.3 3.0 | 58.31 .41 | 33.5 3.1 | 17.93 −.02 | 72.2 1.1 | 16.59 .00 | 1.7 0.6 |
| 17.4 | 33.62 .38 | 44.1 2.7 | 57.85 .52 | 36.4 2.8 | 17.90 .06 | 73.2 0.9 | 16.57 −.04 | 1.2 0.5 |
| 27.4 | 33.20 .45 | 46.6 2.3 | 57.28 .61 | 39.0 2.4 | 17.82 .09 | 74.1 0.7 | 16.51 .08 | 0.8 0.3 |
| Sept. 6.3 | 32.72 .51 | 48.8 1.9 | 56.63 .69 | 41.2 2.0 | 17.72 .12 | 74.7 0.5 | 16.42 .11 | 0.5 0.2 |
| 16.3 | 32.19 .56 | 50.4 1.4 | 55.91 .75 | 43.0 1.6 | 17.58 .14 | 75.2 0.3 | 16.29 .14 | 0.4 +0.1 |
| 26.3 | 31.62 .59 | 51.6 0.9 | 55.14 .79 | 44.3 1.1 | 17.43 .16 | 75.4 +0.1 | 16.15 .15 | 0.3 0.0 |
| Oct. 6.3 | 31.02 .60 | 52.3 +0.4 | 54.33 .82 | 45.1 +0.5 | 17.27 .16 | 75.4 −0.1 | 15.99 .16 | 0.4 −0.1 |
| 16.2 | 30.43 .60 | 52.4 −0.1 | 53.51 .82 | 45.4 0.0 | 17.11 .16 | 75.3 0.3 | 15.83 .16 | 0.6 0.2 |
| 26.2 | 29.84 .58 | 52.0 0.7 | 52.70 .79 | 45.1 −0.6 | 16.96 .14 | 74.9 0.5 | 15.68 .14 | 0.9 0.3 |
| Nov. 5.2 | 29.28 .54 | 51.0 1.2 | 51.93 .75 | 44.2 1.1 | 16.82 .12 | 74.4 0.6 | 15.55 .12 | 1.3 0.4 |
| 15.2 | 28.77 .48 | 49.5 1.8 | 51.21 .68 | 42.9 1.7 | 16.72 .09 | 73.6 0.8 | 15.44 .09 | 1.7 0.5 |
| 25.1 | 28.32 .41 | 47.5 2.3 | 50.57 .60 | 41.0 2.2 | 16.64 .06 | 72.7 1.0 | 15.37 .06 | 2.2 0.6 |
| Dec. 5.1 | 27.95 .33 | 45.1 2.7 | 50.02 .49 | 38.6 2.6 | 16.60 −.02 | 71.6 1.1 | 15.33 −.02 | 2.8 0.6 |
| 15.1 | 27.67 .24 | 42.2 3.1 | 49.59 .37 | 35.8 3.0 | 16.61 +.02 | 70.5 1.2 | 15.33 +.02 | 3.5 0.7 |
| 25.0 | 27.48 .13 | 39.0 3.3 | 49.28 .24 | 32.7 3.2 | 16.65 .06 | 69.2 1.3 | 15.37 .06 | 4.2 0.7 |
| 35.0 | 27.40 −.03 | 35.6 −3.5 | 49.11 −.10 | 29.4 −3.4 | 16.73 +.10 | 67.8 −1.4 | 15.45 +.10 | 4.9 −0.7 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | γ Aquilæ. | | α Aquilæ. (*Altair.*) | | *ε Draconis. | | β Aquilæ. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 19 40 | +10 18 | 19 44 | +8 32 | 19 48 | +69 56 | 19 49 | +6 5 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.0 | 20.45 +.06 | 37.2 −1.7 | 42.58 +.06 | 24.3 −1.6 | 30.42 −.18 | 63.6 −3.2 | 11.94 +.06 | 46.7 −1.5 |
| 11.0 | 20.53 .10 | 35.5 1.7 | 42.65 .10 | 22.6 1.6 | 30.30 −.07 | 60.3 3.4 | 12.02 .09 | 45.2 1.5 |
| 21.0 | 20.64 .13 | 33.7 1.7 | 42.77 .13 | 21.1 1.6 | 30.28 +.05 | 56.8 3.4 | 12.13 .13 | 43.7 1.5 |
| 31.0 | 20.79 .17 | 32.1 1.6 | 42.91 .16 | 19.6 1.4 | 30.39 .17 | 53.4 3.4 | 12.27 .16 | 42.3 1.3 |
| Feb. 9.9 | 20.97 .20 | 30.7 1.4 | 43.09 .19 | 18.2 1.2 | 30.62 .28 | 50.2 3.1 | 12.44 .19 | 41.1 1.1 |
| 19.9 | 21.18 .22 | 29.4 1.1 | 43.30 .22 | 17.1 1.0 | 30.95 .39 | 47.2 2.8 | 12.64 .21 | 40.1 0.9 |
| 29.9 | 21.41 .24 | 28.5 0.8 | 43.53 .24 | 16.2 0.7 | 31.39 .48 | 44.6 2.4 | 12.87 .24 | 39.3 0.6 |
| Mar. 10.9 | 21.67 .26 | 27.9 −0.4 | 43.78 .26 | 15.7 −0.4 | 31.91 .56 | 42.5 1.8 | 13.12 .26 | 38.8 −0.3 |
| 20.8 | 21.94 .28 | 27.7 0.0 | 44.05 .28 | 15.5 0.0 | 32.49 .61 | 40.9 1.2 | 13.39 .28 | 38.7 +0.1 |
| 30.8 | 22.23 .29 | 27.8 +0.4 | 44.34 .29 | 15.7 +0.4 | 33.13 .65 | 40.0 −0.6 | 13.67 .29 | 39.0 0.4 |
| Apr. 9.8 | 22.52 .30 | 28.4 0.7 | 44.63 .30 | 16.3 0.8 | 33.79 .67 | 39.7 +0.1 | 13.97 .30 | 39.5 0.8 |
| 19.7 | 22.83 .31 | 29.3 1.1 | 44.94 .31 | 17.3 1.1 | 34.47 .67 | 40.1 0.7 | 14.27 .31 | 40.5 1.1 |
| 29.7 | 23.13 .30 | 30.6 1.4 | 45.24 .31 | 18.5 1.4 | 35.13 .65 | 41.1 1.3 | 14.57 .31 | 41.7 1.4 |
| May 9.7 | 23.43 .30 | 32.1 1.7 | 45.55 .30 | 20.1 1.7 | 35.75 .61 | 42.8 1.9 | 14.88 .30 | 43.2 1.6 |
| 19.7 | 23.72 .28 | 33.9 1.9 | 45.84 .29 | 21.8 1.9 | 36.33 .55 | 44.9 2.4 | 15.17 .29 | 44.9 1.8 |
| 29.6 | 23.99 .26 | 35.9 2.1 | 46.12 .27 | 23.8 2.0 | 36.84 .47 | 47.5 2.8 | 15.45 .27 | 46.8 1.9 |
| June 8.6 | 24.24 .24 | 38.0 2.2 | 46.37 .24 | 25.9 2.1 | 37.27 .39 | 50.5 3.1 | 15.71 .25 | 48.7 2.0 |
| 18.6 | 24.47 .21 | 40.2 2.2 | 46.60 .21 | 28.0 2.1 | 37.61 .29 | 53.7 3.4 | 15.94 .21 | 50.7 2.0 |
| 28.6 | 24.65 .17 | 42.3 2.1 | 46.79 .18 | 30.1 2.1 | 37.85 .18 | 57.2 3.5 | 16.13 .18 | 52.7 1.9 |
| July 8.5 | 24.80 .13 | 44.4 2.1 | 46.95 .14 | 32.1 2.0 | 37.98 +.07 | 60.8 3.6 | 16.29 .14 | 54.6 1.9 |
| 18.5 | 24.91 .09 | 46.4 1.9 | 47.06 .09 | 34.0 1.9 | 38.00 −.04 | 64.4 3.6 | 16 41 .10 | 56.4 1.7 |
| 28.5 | 24.97 +.04 | 48.3 1.8 | 47.13 +.05 | 35.8 1.7 | 37.91 .14 | 68.0 3.5 | 16.49 .05 | 58.0 1.6 |
| Aug. 7.4 | 24.99 .00 | 49.9 1.6 | 47.15 .00 | 37.4 1.5 | 37.71 .25 | 71.4 3.3 | 16.52 +.01 | 59.5 1.4 |
| 17.4 | 24.96 −.05 | 51.4 1.4 | 47.13 −.04 | 38.8 1.3 | 37.41 .35 | 74.6 3.1 | 16.51 −.03 | 60.7 1.2 |
| 27.4 | 24.90 .08 | 52.6 1.1 | 47.08 .08 | 40.0 1.1 | 37.01 .44 | 77.5 2.8 | 16.45 .07 | 61.8 1.0 |
| Sept. 6.4 | 24.80 .12 | 53.6 0.9 | 46.98 .11 | 40.9 0.8 | 36.54 .51 | 80.1 2.4 | 16.36 .11 | 62.6 0.7 |
| 16.3 | 24.67 .14 | 54.4 0.6 | 46.86 .14 | 41.6 0.6 | 35.99 .58 | 82.3 2.0 | 16.24 .13 | 63.3 0.5 |
| 26.3 | 24.52 .16 | 54.9 0.4 | 46.71 .15 | 42.1 0.3 | 35.39 .62 | 84.0 1.5 | 16.10 .15 | 63.6 +0.3 |
| Oct. 6.3 | 24.36 .17 | 55.1 +0.1 | 46.55 .16 | 42.3 +0.1 | 34.75 .65 | 85.2 1.0 | 15.94 .16 | 63.8 0.0 |
| 16.3 | 24.19 .17 | 55.0 −0.2 | 46.39 .16 | 42.3 −0.2 | 34.09 .67 | 86.0 +0.5 | 15.78 .16 | 63.7 −0.2 |
| 26.2 | 24.03 .16 | 54.7 0.4 | 46.23 .15 | 42.0 0.4 | 33.42 .66 | 86.2 −0.1 | 15.63 .15 | 63.4 0.4 |
| Nov. 5.2 | 23.88 .14 | 54.2 0.7 | 46.09 .13 | 41.5 0.7 | 32.77 .63 | 85.8 0.7 | 15.48 .13 | 62.9 0 6 |
| 15.2 | 23.76 .11 | 53.3 0.9 | 45.97 .11 | 40.7 0.9 | 32.16 .59 | 84.8 1.2 | 15.36 .11 | 62.2 0.8 |
| 25.1 | 23.66 .08 | 52.3 1.2 | 45.87 .08 | 39.7 1.1 | 31.60 .53 | 83.3 1.8 | 15.27 .08 | 61.3 1.0 |
| Dec. 5.1 | 23.60 .04 | 51.0 1.4 | 45.81 .04 | 38.6 1.3 | 31.11 .45 | 81.3 2.3 | 15.21 .04 | 60.2 1.2 |
| 15.1 | 23.58 −.01 | 49.6 1.5 | 45.79 −.01 | 37.2 1.4 | 30.70 .36 | 78.8 2.7 | 15.18 −.01 | 58.9 1.3 |
| 25.0 | 23.59 +.03 | 48.0 1.7 | 45.80 +.03 | 35.7 1.5 | 30.39 .25 | 76.0 3.0 | 15.19 +.03 | 57.6 1.4 |
| 35.0 | 23.65 +.07 | 46.3 −1.7 | 45.86 +.07 | 34.2 −1.6 | 30.20 −.14 | 72.8 −3.3 | 15.24 +.07 | 56.1 −1.5 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | τ Aquilæ. | | α² Capricorni. | | *κ Cephei. | | α Pavonis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
| | h m<br>19 58 | ° ′<br>+6 55 | h m<br>20 11 | ° ′<br>−12 55 | h m<br>20 12 | ° ′<br>+77 19 | h m<br>20 15 | ° ′<br>−57 7 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.0 | 3.59 +.05 | 38.6 −1.5 | 9.13 +.05 | 49.4 −0.3 | 54.66 −.46 | 72.4 −3.0 | 48.12 +.03 | 61.7 +2.2 |
| 11.0 | 3.65 .08 | 37.1 1.5 | 9.20 .09 | 49.7 0.3 | 54.28 .28 | 69.3 3.2 | 48.19 .11 | 59.4 2.4 |
| 21.0 | 3.75 .12 | 35.6 1.4 | 9.30 .12 | 50.0 0.2 | 54.10 −.09 | 66.0 3.4 | 48.33 .17 | 57.0 2.4 |
| 31.0 | 3.89 .15 | 34.2 1.3 | 9.44 .15 | 50.1 −0.1 | 54.10 +.10 | 62.7 3.4 | 48.54 .24 | 54.6 2.5 |
| Feb. 9.9 | 4.05 .18 | 33.0 1.1 | 9.60 .18 | 50.2 0.0 | 54.29 .29 | 59.4 3.2 | 48.80 .29 | 52.1 2.4 |
| 19.9 | 4.24 .21 | 31.9 0.9 | 9.80 .21 | 50.1 +0.2 | 54.66 .46 | 56.2 3.0 | 49.12 .35 | 49.7 2.4 |
| 29.9 | 4.46 .23 | 31.2 0.6 | 10.02 .24 | 49.9 0.3 | 55.20 .62 | 53.4 2.6 | 49.49 .39 | 47.4 2.2 |
| Mar. 10.9 | 4.71 .25 | 30.7 −0.3 | 10.27 .26 | 49.5 0.5 | 55.90 .76 | 51.1 2.1 | 49.91 .43 | 45.3 2.1 |
| 20.8 | 4.97 .27 | 30.5 0.0 | 10.54 .28 | 48.9 0.7 | 56.72 .87 | 49.2 1.6 | 50.36 .47 | 43.3 1.9 |
| 30.8 | 5.25 .29 | 30.8 +0.4 | 10.83 .30 | 48.1 0.9 | 57.63 .95 | 47.9 1.0 | 50.84 .50 | 41.6 1.6 |
| Apr. 9.8 | 5.54 .30 | 31.4 0.8 | 11.13 .31 | 47.1 1.0 | 58.60 .98 | 47.3 −0.3 | 51.35 .52 | 40.1 1.4 |
| 19.8 | 5.85 .31 | 32.3 1.1 | 11.44 .32 | 46.0 1.2 | 59.61 1.01 | 47.3 +0.3 | 51.87 .53 | 38.8 1.1 |
| 29.7 | 6.15 .31 | 33.5 1.4 | 11.76 .32 | 44.8 1.3 | 60.61 .99 | 47.9 0.9 | 52.41 .54 | 37.9 0.8 |
| May 9.7 | 6.46 .30 | 35.1 1 6 | 12.08 .32 | 43.5 1.3 | 61.57 .93 | 49.1 1.5 | 52.94 .53 | 37.3 0.4 |
| 19.7 | 6.75 .29 | 36.8 1.8 | 12.40 .31 | 42.2 1.4 | 62.46 .85 | 50.9 2.1 | 53.47 .52 | 37.1 +0.1 |
| 29.6 | 7.04 .27 | 38.7 2.0 | 12.70 .30 | 40.8 1.3 | 63.26 .75 | 53.2 2.5 | 53.97 .49 | 37.1 −0.3 |
| June 8.6 | 7.30 .25 | 40.7 2.0 | 12.99 .28 | 39.5 1.3 | 63.95 .62 | 56.0 2.9 | 54.44 .45 | 37.6 0.6 |
| 18.6 | 7.54 .22 | 42.8 2.1 | 13.25 .25 | 38.3 1.2 | 64.50 .48 | 59.0 3.2 | 54.87 .41 | 38.4 1.0 |
| 28.6 | 7.74 .19 | 44.8 2.0 | 13.49 .21 | 37.2 1.0 | 64.90 .32 | 62.4 3.4 | 55.25 .35 | 39.5 1.3 |
| July 8.5 | 7.91 .15 | 46.8 1.9 | 13.68 .18 | 36.2 0.9 | 65.14 +.15 | 65.9 3.6 | 55.57 .28 | 40.9 1.5 |
| 18.5 | 8.03 .11 | 48.7 1.8 | 13.84 .13 | 35.4 0.7 | 65.20 −.02 | 69.5 3.6 | 55.81 .21 | 42.5 1.7 |
| 28.5 | 8.12 .06 | 50.4 1.6 | 13.95 .09 | 34.7 0.6 | 65.11 .18 | 73.1 3.6 | 55.98 .13 | 44.3 1.9 |
| Aug. 7.5 | 8.16 +.02 | 52.0 1.5 | 14.01 +.04 | 34.3 0.4 | 64.84 .35 | 76.6 3.5 | 56.08 +.05 | 46.2 2.0 |
| 17.4 | 8.15 −.03 | 53.3 1.3 | 14.03 .00 | 34.0 0.2 | 64.42 .50 | 80.0 3.3 | 56.09 −.03 | 48.2 2.0 |
| 27.4 | 8.10 .07 | 54.5 1.0 | 14.00 −.05 | 33.8 +0.1 | 63.85 .64 | 83.2 3.1 | 56.02 .10 | 50.1 1.9 |
| Sept. 6.4 | 8.01 .10 | 55.4 0.8 | 13.93 .09 | 33.7 0.0 | 63.15 .77 | 86.1 2.7 | 55.89 .17 | 52.0 1.8 |
| 16.3 | 7.90 .13 | 56.1 0.6 | 13.83 .12 | 33.8 −0.1 | 62.33 .87 | 88.7 2.4 | 55.69 .23 | 53.6 1.5 |
| 26.3 | 7.76 .15 | 56.5 0.3 | 13.71 .14 | 34.0 0.2 | 61.41 .96 | 90.8 1.9 | 55.44 .27 | 55.0 1.2 |
| Oct. 6.3 | 7.61 .16 | 56.7 +0.1 | 13.56 .15 | 34.2 0.3 | 60.41 1.03 | 92.5 1.5 | 55.16 .30 | 56.1 0.9 |
| 16.3 | 7.45 .16 | 56.7 −0.1 | 13.41 .15 | 34.5 0.3 | 59.37 1.06 | 93.7 0.9 | 54.85 .31 | 56.8 0.5 |
| 26.2 | 7.29 .15 | 56.5 0.4 | 13.26 .15 | 34.8 0.3 | 58.30 1.07 | 94.4 +0.4 | 54.54 .31 | 57.1 −.01 |
| Nov. 5.2 | 7.15 .14 | 56.0 0.6 | 13.12 .13 | 35.2 0.3 | 57.23 1.06 | 94.5 −0.2 | 54.24 .29 | 56.9 +0.4 |
| 15.2 | 7.02 .11 | 55.3 0.8 | 12.99 .11 | 35.5 0.3 | 56.19 1.01 | 94.0 0.8 | 53.97 .25 | 56.4 0.8 |
| 25.2 | 6.92 .08 | 54.4 1.0 | 12.90 .08 | 35.8 0.4 | 55.21 .94 | 92.9 1.3 | 53.75 .20 | 55.4 1.2 |
| Dec. 5.1 | 6.86 .05 | 53.3 1.2 | 12.83 .05 | 36 2 0.4 | 54.32 .84 | 91.4 1.9 | 53.57 .14 | 54.0 1.5 |
| 15.1 | 6.82 −.01 | 52.1 1.3 | 12.80 −.01 | 36.5 0.3 | 53.55 .71 | 89.3 2.3 | 53.46 .08 | 52.3 1.9 |
| 25.1 | 6.83 +.02 | 50.7 1.4 | 12.81 +.03 | 36.9 0.3 | 52.91 .56 | 86.7 2.7 | 53.42 −.01 | 50.4 2.1 |
| 35.0 | 6.87 +.06 | 49.3 −1.4 | 12.85 +.06 | 37.2 −0.3 | 52.44 −.39 | 83.8 −3.1 | 53.45 +.06 | 48.2 +2.3 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | π Capricorni. | | ε Delphini. | | *Groombridge 3241. | | α Cygni. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>20 20 | ° ′<br>−18 36 | h m<br>20 27 | ° ′<br>+10 52 | h m<br>20 30 | ° ′<br>+72 6 | h m<br>20 37 | ° ′<br>+44 49 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.0 | 12.09 +.04 | 70.3 0.0 | 15.97 +.02 | 52.9 −1.6 | 26.68 −.33 | 43.2 −2.9 | 10.23 −.07 | 76.1 −2.6 |
| 11.0 | 12.15 .08 | 70.2 +0.1 | 16.00 .05 | 51.3 1.6 | 26.40 .21 | 40.2 3.2 | 10.19 −.02 | 73.3 2.9 |
| 21.0 | 12.25 .12 | 70.1 0.2 | 16.07 .08 | 49.7 1.6 | 26.25 −.08 | 36.9 3.3 | 10.19 +.03 | 70.4 3.0 |
| 31.0 | 12.38 .15 | 69:9 0.3 | 16.17 .12 | 48.2 1.5 | 26.24 +.05 | 33.6 3.4 | 10.25 .08 | 67.5 2.9 |
| Feb. 10.0 | 12.55 .18 | 69.6 0.4 | 16.30 .15 | 46.8 1.3 | 26.35 .18 | 30.2 3.3 | 10.36 .13 | 64.6 2.8 |
| 19.9 | 12.74 .21 | 69.1 0.5 | 16.47 .18 | 45.6 1.1 | 26.59 .31 | 27.1 3.0 | 10.52 .18 | 61.9 2.6 |
| 29.9 | 12.97 .24 | 68.6 0.6 | 16.66 .21 | 44.6 0.8 | 26.96 .42 | 24.2 2.7 | 10.72 .23 | 59.5 2.2 |
| Mar. 10.9 | 13.21 .26 | 67.8 0.8 | 16.88 .23 | 44.0 0.5 | 27.43 .53 | 21.7 2.3 | 10.97 .27 | 57.6 1.7 |
| 20.9 | 13.49 .28 | 67.0 0.9 | 17.13 .26 | 43.7 −0.1 | 28.00 .61 | 19.7 1.7 | 11.26 .31 | 56.1 1.2 |
| 30.8 | 13.78 .30 | 66.0 1.1 | 17.40 .28 | 43.8 +0.3 | 28.65 .68 | 18.3 1.1 | 11.58 .34 | 55.1 0.7 |
| Apr. 9.8 | 14.08 .31 | 64.9 1.2 | 17.68 .29 | 44.3 0.7 | 29.35 .72 | 17.5 −0.5 | 11.93 .36 | 54.7 −0.1 |
| 19.8 | 14.40 .33 | 63.7 1.2 | 17.98 .30 | 45.2 1.1 | 30.09 .74 | 17.4 +0.2 | 12.29 .38 | 55.0 +0.5 |
| 29.7 | 14.73 .33 | 62.5 1.3 | 18.29 .31 | 46.4 1.4 | 30.83 .74 | 17.8 0.8 | 12.67 .38 | 55.8 1.1 |
| May 9.7 | 15.06 .33 | 61.2 1.3 | 18.60 .31 | 47.9 1.7 | 31.56 .72 | 18.9 1.4 | 13.05 .38 | 57.1 1.6 |
| 19.7 | 15.39 .32 | 59.9 1.3 | 18.91 .30 | 49.7 1.9 | 32.26 .67 | 20.6 2.0 | 13.42 .36 | 59.0 2.1 |
| 29.7 | 15.71 .31 | 58.7 1.2 | 19.20 .29 | 51.7 2.1 | 32.90 .60 | 22.8 2.4 | 13.77 .34 | 61.3 2.5 |
| June 8.6 | 16.01 .29 | 57.6 1.1 | 19.48 .27 | 53.8 2.2 | 33.46 .52 | 25.5 2.9 | 14.10 .31 | 64.0 2.9 |
| 18.6 | 16.29 .26 | 56.6 0.9 | 19.74 .24 | 56.1 2.3 | 33.94 .42 | 28.5 3.2 | 14.39 .27 | 67.0 3.1 |
| 28.6 | 16.53 .23 | 55.7 0.8 | 19.96 .21 | 58.4 2.3 | 34.31 .32 | 31.8 3.4 | 14.64 .23 | 70.2 3.3 |
| July 8.6 | 16.74 .19 | 55.0 0.6 | 20.15 .17 | 60.6 2.2 | 34.57 .20 | 35.3 3.6 | 14.84 .18 | 73.5 3.4 |
| 18.5 | 16.91 .15 | 54.5 0.4 | 20.30 .13 | 62.8 2.1 | 34.71 +.08 | 39.0 3.7 | 14.99 .12 | 76.9 3.4 |
| 28.5 | 17.03 .10 | 54.2 0.3 | 20.41 .09 | 64.8 1.9 | 34.73 −.03 | 42.7 3.7 | 15.08 .06 | 80.3 3.3 |
| Aug. 7.5 | 17.11 +.05 | 54.0 +0.1 | 20.47 +.04 | 66.6 1.7 | 34.63 .16 | 46.3 3.6 | 15.12 +.01 | 83.6 3 2 |
| 17.4 | 17.14 .00 | 54.0 −0.1 | 20.49 −.01 | 68.3 1.5 | 34.41 .28 | 49.8 3.4 | 15.09 −.05 | 86.7 3.0 |
| 27.4 | 17.12 −.04 | 54.1 0.2 | 20.46 .05 | 69.7 1.3 | 34.08 .38 | 53.1 3.2 | 15.01 .10 | 89.5 2.7 |
| Sept. 6.4 | 17.06 .08 | 54.4 0.3 | 20.40 .08 | 70.9 1.1 | 33.65 .48 | 56.2 2.9 | 14.89 .15 | 92.1 2.4 |
| 16.4 | 16.96 .11 | 54.7 0.4 | 20.30 .11 | 71.8 0.8 | 33.13 .56 | 58.9 2.5 | 14.72 .19 | 94.4 2.1 |
| 26.3 | 16 84 .14 | 55.1 0.4 | 20.18 .14 | 72.5 0.6 | 32.53 .63 | 61.2 2.1 | 14.51 .22 | 96.3 1.7 |
| Oct. 6.3 | 16.69 .15 | 55.5 0.4 | 20.03 .15 | 72.9 +0.3 | 31.87 .68 | 63.1 1.7 | 14.28 .24 | 97.7 1.2 |
| 16.3 | 16.54 .16 | 55.8 0.4 | 19.88 .16 | 73.1 0.0 | 31.17 .72 | 64.5 1.1 | 14.03 .26 | 98.7 0.8 |
| 26 3 | 16.38 .15 | 56.2 0.3 | 19.72 .16 | 73.0 −0.2 | 30.45 .73 | 65.4 +0.6 | 13.77 .26 | 99.2 +0.3 |
| Nov. 5.2 | 16.24 .14 | 56.5 0.3 | 19.57 .14 | 72.6 0.5 | 29.72 .72 | 65.7 0.0 | 13.51 .25 | 99.2 −0.3 |
| 15.2 | 16.11 .12 | 56.8 0.2 | 19.43 .13 | 72.0 0.7 | 29.01 .70 | 65.4 −0.6 | 13.27 .24 | 98.7 0.8 |
| 25.2 | 16.00 .09 | 57.0 0.2 | 19.32 .10 | 71.1 1.0 | 28.33 .65 | 64.5 1.2 | 13.04 .21 | 97.7 1.2 |
| Dec. 5.1 | 15.93 .06 | 57.1 0.1 | 19.23 .07 | 70.1 1.2 | 27.71 .58 | 63.1 1.7 | 12.85 .18 | 96.3 1.7 |
| 15.1 | 15.90 −.02 | 57.2 −0.1 | 19.18 −.04 | 68.8 1.3 | 27.17 .50 | 61.2 2.2 | 12.69 .14 | 94.4 2.1 |
| 25.1 | 15.89 +.02 | 57.2 0.0 | 19.15 +.01 | 67.4 1.5 | 26.72 .40 | 58.8 2.6 | 12.57 .10 | 92.1 2.5 |
| 35.1 | 15.93 +.06 | 57.2 +0.1 | 19.16 +.03 | 65.9 −1.5 | 26.37 −.29 | 55.9 −3.0 | 12.50 −.05 | 89.5 −2.7 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | μ Aquarii. | | ν Cygni. | | *12 Year Cat. 1879. | | 61 Cygni (*pr.*) | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | 20h 45m | −9° 26′ | 20h 52m | +40° 41′ | 20h 52m | +80° 4′ | 21h 1m | +38° 8′ |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.1 | 56.68 +.02 | 58.6 −0.5 | 31.16 −.07 | 27.3 −2.5 | 60.23− .79 | 73.6 −2.6 | 18.68 −.06 | 26.7 −2.2 |
| 11.1 | 56.71 .05 | 59.1 0.4 | 31.12 −.03 | 24.7 2.7 | 59.54 .59 | 70.9 2.9 | 18.64 −.02 | 24.4 2.5 |
| 21.0 | 56.78 .08 | 59.4 0.3 | 31.11 +.02 | 22.0 2.8 | 59.06 .36 | 67.8 3.2 | 18.64 +.03 | 21.8 2.6 |
| 31.0 | 56.88 .11 | 59.7 0.2 | 31.16 .07 | 19.2 2.8 | 58.82− .12 | 64.6 3.3 | 18.69 .07 | 19.3 2.6 |
| Feb. 10.0 | 57.01 .14 | 59.9 −0.1 | 31.25 .11 | 16.5 2.7 | 58.82+ .23 | 61.3 3.3 | 18.78 .11 | 16.7 2.5 |
| 20.0 | 57.17 .17 | 59.9 +0.1 | 31.38 .16 | 14.0 2.4 | 59.07 .36 | 58.1 3.1 | 18.91 .16 | 14.4 2.3 |
| 29.9 | 57.35 .20 | 59.7 0.3 | 31.56 .20 | 11.7 2.1 | 59.54 .59 | 55.1 2.9 | 19.09 .20 | 12.3 1.9 |
| Mar. 10.9 | 57.57 .23 | 59.3 0.5 | 31.79 .24 | 9.8 1.7 | 60.23 .79 | 52.4 2.5 | 19.31 .24 | 10.5 1.6 |
| 20.9 | 57.81 .25 | 58.7 0.7 | 32.05 .28 | 8.3 1.2 | 61.11 .96 | 50.1 2.0 | 19.57 .28 | 9.2 1.1 |
| 30.8 | 58.07 .27 | 57.9 0.9 | 32.34 .31 | 7.4 0.7 | 62.14 1.10 | 48.4 1.5 | 19.86 .31 | 8.3 −0.6 |
| Apr. 9.8 | 58.36 .29 | 56.9 1.1 | 32.67 .34 | 7.0 −0.1 | 63.29 1.20 | 47.2 0.9 | 20.18 .33 | 8.0 0.0 |
| 19.8 | 58.66 .31 | 55.7 1.3 | 33.02 .35 | 7.1 +0.5 | 64.52 1.25 | 46.6 −0.3 | 20.52 .35 | 8.3 +0.5 |
| 29.8 | 58.97 .32 | 54.3 1.4 | 33.37 .36 | 7.9 1.0 | 65.78 1.26 | 46.7 +0.4 | 20.88 .37 | 9.1 1.1 |
| May 9.7 | 59.29 .32 | 52.9 1.5 | 33.74 .37 | 9.1 1.5 | 67.03 1.23 | 47.4 1.0 | 21.25 .37 | 10.4 1.6 |
| 19.7 | 59.61 .32 | 51.3 1.6 | 34.10 .36 | 10.9 2.0 | 68.23 1.16 | 48.7 1.6 | 21.62 .36 | 12.2 2.0 |
| 29.7 | 59.92 .31 | 49.7 1.6 | 34.45 .34 | 13.1 2.4 | 69.35 1.06 | 50.5 2.1 | 21.97 .35 | 14.5 2.4 |
| June 8.7 | 60.22 .29 | 48.1 1.6 | 34.78 .31 | 15.7 2.7 | 70.34 .92 | 52.8 2.5 | 22.31 .32 | 17.1 2.8 |
| 18.6 | 60.51 .27 | 46.6 1.5 | 35.07 .28 | 18.6 3.0 | 71.19 .76 | 55.6 2.9 | 22.61 .29 | 20.0 3.0 |
| 28.6 | 60.76 .24 | 45.1 1.4 | 35.33 .24 | 21.7 3.2 | 71.86 .58 | 58.7 3.2 | 22.89 .26 | 23.1 3.2 |
| July 8.6 | 60.98 .20 | 43.9 1.2 | 35.55 .19 | 24.9 3.3 | 72.35 .39 | 62.0 3.5 | 23.12 .21 | 26.3 3.3 |
| 18.5 | 61.16 .16 | 42.7 1.0 | 35.72 .14 | 28.2 3.3 | 72.63+ .18 | 65.6 3.6 | 23.31 .16 | 29.6 3.3 |
| 28.5 | 61.30 .12 | 41.8 0.9 | 35.83 .09 | 31.5 3.3 | 72.71− .03 | 69.3 3.7 | 23.45 .11 | 33.0 3.3 |
| Aug. 7.5 | 61.39 .07 | 41.0 0.7 | 35.89 +.03 | 34.7 3.1 | 72.58 .23 | 72.9 3.7 | 23.53 .06 | 36.2 3.2 |
| 17.5 | 61.44 +.03 | 40.5 0.5 | 35.90 −.02 | 37.7 3.0 | 72.25 .43 | 76.6 3.6 | 23.56 +.01 | 39.3 3.0 |
| 27.4 | 61.44 −.02 | 40.1 0.3 | 35.85 .07 | 40.6 2.7 | 71.72 .62 | 80.1 3.4 | 23.55 −.04 | 42.1 2.8 |
| Sept. 6.4 | 61.41 .06 | 39.9 +0.1 | 35.76 .12 | 43.1 2.4 | 71.01 .80 | 83.3 3.2 | 23.48 .09 | 44.7 2.5 |
| 16.4 | 61.33 .09 | 39.8 0.0 | 35.62 .16 | 45.4 2.1 | 70.13 .96 | 86.3 2.9 | 23.37 .13 | 47.0 2.1 |
| 26.4 | 61.23 .12 | 39.9 −0.1 | 35.45 .19 | 47.3 1.7 | 69.11 1.09 | 89.0 2.5 | 23.22 .16 | 49.0 1.8 |
| Oct. 6.3 | 61.10 .14 | 40.0 0.2 | 35.25 .21 | 48.7 1.3 | 67.96 1.20 | 91.3 2.1 | 23.05 .18 | 50.6 1.4 |
| 16.3 | 60.96 .15 | 40.3 0.3 | 35.03 .23 | 49.8 0.8 | 66.72 1.28 | 93.2 1.6 | 22.86 .20 | 51.8 1.0 |
| 26.3 | 60.82 .14 | 40.7 0.4 | 34.80 .23 | 50.4 +0.4 | 65.41 1.33 | 94.5 1.1 | 22.66 .20 | 52.5 +0.5 |
| Nov. 5.3 | 60.67 .14 | 41.0 0.4 | 34.57 .23 | 50.5 −0.1 | 64.06 1.35 | 95.3 +0.5 | 22.45 .20 | 52.7 0.0 |
| 15.2 | 60.55 .12 | 41.5 0.4 | 34.35 .21 | 50.2 0.6 | 62.72 1.33 | 95.5 −0.1 | 22.25 .19 | 52.5 −0.4 |
| 25.2 | 60.44 .10 | 41.9 0.5 | 34.15 .19 | 49.3 1.1 | 61.41 1.28 | 95.1 0.7 | 22.07 .17 | 51.9 0.9 |
| Dec. 5.2 | 60.36 .07 | 42.4 0.5 | 33.97 .17 | 48.1 1.5 | 60.17 1.19 | 94.2 1.3 | 21.91 .15 | 50.8 1.3 |
| 15.1 | 60.30 .04 | 42.9 0.5 | 33.82 .13 | 46.3 1.9 | 59.04 1.06 | 92.7 1.8 | 21.78 .12 | 49.2 1.7 |
| 25.1 | 60.28 −.01 | 43.4 0.5 | 33.71 .09 | 44.3 2.3 | 58.05 .91 | 90.6 2.3 | 21.68 .08 | 47.4 2.0 |
| 35.1 | 60.29 +.03 | 43.8 −0.5 | 33.64 −.05 | 41.8 −2.6 | 57.23− .73 | 88.1 −2.8 | 21.62 −.04 | 45.2 −2.3 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ζ Cygni. | | α Cephei. | | 1 Pegasi. | | β Aquarii. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 21 7 | +29 42 | 21 15 | +62 3 | 21 16 | +19 16 | 21 25 | -6 6 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.1 | 38.02 -.05 | 68.3 -2.0 | 34.06 -.24 | 41.5 -2.5 | 19.89 -.04 | 28.3 -1.7 | 0.82 -.02 | 63.5 -0.6 |
| 11.1 | 37.99 -.01 | 66.2 2.2 | 33.85 .17 | 38.9 2.8 | 19.87 .00 | 26.6 1.8 | 0.81 +.01 | 64.1 0.5 |
| 21.1 | 37.99 +.02 | 63.9 2.3 | 33.72 .10 | 35.9 3.1 | 19.89 +.03 | 24.7 1.8 | 0.84 .04 | 64.5 0.4 |
| 31.0 | 38.04 .06 | 61.6 2.3 | 33.66 -.02 | 32.8 3.2 | 19.93 .06 | 22.9 1.8 | 0.90 .07 | 64.9 0.3 |
| Feb. 10.0 | 38.12 .10 | 59.3 2.2 | 33.69 +.07 | 29.6 3.2 | 20.01 .10 | 21.2 1.7 | 0.98 .10 | 65.2 -0.2 |
| 20.0 | 38.23 .14 | 57.2 2.0 | 33.79 .15 | 26.5 3.1 | 20.12 .13 | 19.6 1.5 | 1.10 .13 | 65.3 0.0 |
| 29.9 | 38.39 .18 | 55.3 1.7 | 33.98 .23 | 23.5 2.8 | 20.27 .16 | 18.2 1.2 | 1.25 .16 | 65.2 +0.2 |
| Mar. 10.9 | 38.59 .21 | 53.8 1.3 | 34.25 .30 | 20.9 2.4 | 20.45 .20 | 17.2 0.9 | 1.43 .19 | 64.9 0.4 |
| 20.9 | 38.81 .25 | 52.7 0.9 | 34.58 .37 | 18.7 2.0 | 20.67 .23 | 16.5 0.5 | 1.63 .22 | 64.4 0.7 |
| 30.9 | 39.07 .27 | 52.0 -0.4 | 34.98 .43 | 17.0 1.4 | 20.91 .26 | 16.2 -0.1 | 1.87 .25 | 63.6 0.9 |
| Apr. 9.8 | 39.36 .30 | 51.9 +0.1 | 35.44 .47 | 15.9 0.8 | 21.18 .28 | 16.4 +0.4 | 2.13 .27 | 62.5 1.1 |
| 19.8 | 39.67 .32 | 52.2 0.6 | 35.93 .51 | 15.4 -0.2 | 21.47 .30 | 16.9 0.8 | 2.41 .29 | 61.3 1.4 |
| 29.8 | 40.00 .33 | 53.0 1.1 | 36.45 .52 | 15.5 +0.4 | 21.77 .31 | 17.9 1.2 | 2.71 .31 | 59.8 1.6 |
| May 9.8 | 40.33 .34 | 54.3 1.5 | 36.97 .53 | 16.2 1.0 | 22.09 .32 | 19.3 1.6 | 3.02 .32 | 58.2 1.7 |
| 19.7 | 40.67 .33 | 56.0 1.9 | 37.50 .52 | 17.5 1.6 | 22.42 .32 | 21.0 1.9 | 3.34 .32 | 56.5 1.8 |
| 29.7 | 41.00 .32 | 58.1 2.3 | 38.00 .49 | 19.4 2.1 | 22.74 .31 | 23.1 2.2 | 3.66 .32 | 54.7 1.8 |
| June 8.7 | 41.31 .30 | 60.6 2.6 | 38.47 .45 | 21.8 2.6 | 23.04 .30 | 25.3 2.4 | 3.98 .31 | 52.9 1.8 |
| 18.6 | 41.60 .28 | 63.2 2.8 | 38.90 .40 | 24.5 3.0 | 23.33 .28 | 27.8 2.5 | 4.27 .29 | 51.1 1.8 |
| 28.6 | 41.86 .24 | 66.1 2.9 | 39.27 .34 | 27.7 3.3 | 23.60 .25 | 30.3 2.6 | 4.55 .26 | 49.4 1.7 |
| July 8.6 | 42.09 .20 | 69.0 3.0 | 39.57 .27 | 31.1 3.5 | 23.83 .21 | 32.9 2.6 | 4.80 .23 | 47.8 1.5 |
| 18.6 | 42.27 .16 | 72.0 3.0 | 39.80 .19 | 34.6 3.6 | 24.02 .17 | 35.5 2.6 | 5.01 .19 | 46.4 1.3 |
| 28.5 | 42.41 .11 | 74.9 2.9 | 39.95 .11 | 38.3 3.7 | 24.17 .13 | 38.1 2.5 | 5.18 .15 | 45.1 1.2 |
| Aug. 7.5 | 42.50 .06 | 77.7 2.8 | 40.02 +.03 | 42.0 3.7 | 24.27 .08 | 40.5 2.3 | 5.31 .11 | 44.1 1.0 |
| 17.5 | 42.54 +.02 | 80.4 2.6 | 40.01 -.05 | 45.6 3.6 | 24.33 +.04 | 42.7 2.1 | 5.39 .06 | 43.2 0.8 |
| 27.5 | 42.53 -.03 | 82.9 2.4 | 39.93 .13 | 49.1 3.4 | 24.34 -.01 | 44.7 1.9 | 5.43 +.02 | 42.6 0.5 |
| Sept. 6.4 | 42.48 .07 | 85.1 2.1 | 39.76 .20 | 52.4 3.2 | 24.32 .05 | 46.5 1.6 | 5.43 -.02 | 42.2 0.3 |
| 16.4 | 42.39 .11 | 87.0 1.8 | 39.53 .26 | 55.4 2.9 | 24.25 .08 | 48.0 1.4 | 5.38 .06 | 41.9 +0.2 |
| 26.4 | 42.26 .14 | 88.6 1.4 | 39.24 .32 | 58.1 2.5 | 24.15 .11 | 49.2 1.1 | 5.31 .09 | 41.8 0.0 |
| Oct. 6.3 | 42.11 .16 | 89.9 1.1 | 38.90 .36 | 60.4 2.1 | 24.03 .13 | 50.1 0.8 | 5.20 .11 | 41.9 -0.2 |
| 16.3 | 41.94 .18 | 90.8 0.7 | 38.53 .39 | 62.2 1.6 | 23.89 .15 | 50.8 0.5 | 5.08 .13 | 42.1 0.3 |
| 26.3 | 41.76 .18 | 91.3 +0.3 | 38.12 .41 | 63.6 1.1 | 23.73 .15 | 51.1 +0.1 | 4.95 .13 | 42.5 0.4 |
| Nov. 5.3 | 41.58 .18 | 91.4 -0.1 | 37.70 .42 | 64.4 +0.5 | 23.58 .15 | 51.0 -0.2 | 4.82 .13 | 42.9 0.4 |
| 15.2 | 41.41 .17 | 91.0 0.5 | 37.28 .41 | 64.6 -0.1 | 23.43 .15 | 50.7 0.5 | 4.69 .12 | 43.3 0.5 |
| 25.2 | 41.25 .15 | 90.3 0.9 | 36.88 .40 | 64.3 0.6 | 23.29 .13 | 50.1 0.8 | 4.57 .11 | 43.8 0.5 |
| Dec. 5.2 | 41.10 .13 | 89.3 1.3 | 36.49 .37 | 63.4 1.2 | 23.18 .11 | 49.1 1.1 | 4.47 .09 | 44.4 0.6 |
| 15.2 | 40.99 .10 | 87.8 1.6 | 36.15 .33 | 61.9 1.7 | 23.08 .08 | 47.9 1.3 | 4.40 .06 | 45.0 0.6 |
| 25.1 | 40.90 .07 | 86.0 1.9 | 35.84 .27 | 60.0 2.2 | 23.01 .05 | 46.4 1.6 | 4.35 .04 | 45.5 0.6 |
| 35.1 | 40.85 -.03 | 84.0 -2.1 | 35.60 -.21 | 57.6 -2.6 | 22.97 -.02 | 44.8 -1.7 | 4.33 -.01 | 46.1 -0.6 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *β Cephei. | | ξ Aquarii. | | ε Pegasi. | | *11 Cephei. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>21 26 | ° ′<br>+70 0 | h m<br>21 31 | ° ′<br>−8 24 | h m<br>21 38 | ° ′<br>+9 18 | h m<br>21 40 | ° ′<br>+70 44 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.1 | 58.95 −.40 | 65.2 −2.3 | 7.99 −.02 | 41.4 −0.5 | 4.69 −.04 | 23.1 −1.2 | 1.73 −.45 | 33.6 −2.2 |
| 11.1 | 58.59 .31 | 62.6 2.7 | 7.99 +.01 | 41.8 0.4 | 4.67 −.01 | 21.8 1.3 | 1.33 .35 | 31.2 2.6 |
| 21.1 | 58.34 .21 | 59.8 3.0 | 8.01 .04 | 42.2 0.3 | 4.67 +.02 | 20.6 1.3 | 1.03 .25 | 28.5 2.9 |
| 31.0 | 58.18 −.10 | 56.6 3.2 | 8.06 .07 | 42.4 −0.2 | 4.70 .05 | 19.3 1.2 | 0.84 .14 | 25.4 3.1 |
| Feb. 10.0 | 58.15 +.02 | 53.4 3.3 | 8.14 .10 | 42.5 0.0 | 4.76 .08 | 18.2 1.1 | 0.75 −.02 | 22.2 3.2 |
| 20.0 | 58.22 .14 | 50.2 3.2 | 8.25 .13 | 42.5 +0.1 | 4.86 .11 | 17.2 0.9 | 0.79 +.10 | 19.0 3.2 |
| Mar. 1.0 | 58.42 .25 | 47.1 3.0 | 8.40 .16 | 42.2 0.4 | 4.99 .14 | 16.4 0.7 | 0.96 .22 | 15.9 3.0 |
| 10.9 | 58.72 .36 | 44.3 2.6 | 8.57 .19 | 41.8 0.6 | 5.15 .18 | 15.8 0.4 | 1.24 .34 | 13.1 2.7 |
| 20.9 | 59.13 .46 | 41.9 2.2 | 8.78 .22 | 41.1 0.8 | 5.34 .21 | 15.6 −0.1 | 1.63 .44 | 10.5 2.3 |
| 30.9 | 59.63 .54 | 39.9 1.7 | 9.01 .24 | 40.2 1.0 | 5.56 .24 | 15.7 +0.3 | 2.12 .53 | 8.5 1.8 |
| Apr. 9.9 | 60.20 .61 | 38.5 1.1 | 9.26 .27 | 39.1 1.2 | 5.81 .26 | 16.2 0.6 | 2.69 .61 | 6.9 1.3 |
| 19.8 | 60.83 .66 | 37.7 −0.5 | 9.54 .29 | 37.7 1.4 | 6.08 .29 | 17.0 1.0 | 3.33 .66 | 6.0 −0.7 |
| 29.8 | 61.51 .68 | 37.5 +0.1 | 9.84 .31 | 36.2 1.6 | 6.38 .30 | 18.1 1.3 | 4.01 .70 | 5.6 0.0 |
| May 9.8 | 62.19 .69 | 38.0 0.8 | 10.16 .32 | 34.6 1.7 | 6.69 .31 | 19.6 1.6 | 4.72 .71 | 5.9 +0.6 |
| 19.7 | 62.88 .67 | 39.0 1.3 | 10.48 .32 | 32.9 1.8 | 7.01 .32 | 21.3 1.9 | 5.43 .71 | 6.7 1.2 |
| 29.7 | 63.54 .64 | 40.6 1.9 | 10.80 .32 | 31.1 1.8 | 7.32 .32 | 23.2 2.0 | 6.13 .68 | 8.2 1.7 |
| June 8.7 | 64.15 .59 | 42.8 2.4 | 11.12 .31 | 29.3 1.8 | 7.64 .31 | 25.4 2.2 | 6.78 .63 | 10.2 2.2 |
| 18.7 | 64.71 .52 | 45.4 2.8 | 11.42 .29 | 27.6 1.7 | 7.93 .29 | 27.6 2.2 | 7.38 .56 | 12.7 2.7 |
| 28.6 | 65.19 .44 | 48.4 3.2 | 11.70 .27 | 25.9 1.6 | 8.21 .26 | 29.8 2.3 | 7.90 .48 | 15.6 3.1 |
| July 8.6 | 65.59 .35 | 51.7 3.4 | 11.96 .24 | 24.4 1.4 | 8.46 .23 | 32.1 2.2 | 8.34 .39 | 18.8 3.4 |
| 18.6 | 65.89 .25 | 55.2 3.6 | 12.18 .20 | 23.1 1.2 | 8.67 .19 | 34.3 2.2 | 8.69 .29 | 22.3 3.6 |
| 28.5 | 66.08 .14 | 58.9 3.7 | 12.35 .16 | 21.9 1.0 | 8.84 .15 | 36.4 2.0 | 8.93 .19 | 25.9 3.7 |
| Aug. 7.5 | 66.17 +.04 | 62.6 3.8 | 12.49 .11 | 21.0 0.8 | 8.98 .11 | 38.3 1.8 | 9.06 +.08 | 29.7 3.8 |
| 17.5 | 66.16 −.07 | 66.4 3.7 | 12.58 .07 | 20.3 0.6 | 9.06 .06 | 40.0 1.7 | 9.08 −.03 | 33.5 3.8 |
| 27.5 | 60.04 .17 | 70.1 3.6 | 12.62 +.03 | 19.8 0.4 | 9.11 +.02 | 41.6 1.4 | 8.99 .14 | 37.2 3.7 |
| Sept. 6.4 | 65.81 .27 | 73.6 3.4 | 12.63 −.02 | 19.5 +0.2 | 9.11 −.02 | 42.9 1.2 | 8.80 .24 | 40.8 3.5 |
| 16.4 | 65.50 .36 | 76.8 3.1 | 12.59 .06 | 19.3 0.0 | 9.07 .06 | 44.0 1.0 | 8.52 .33 | 44.1 3.2 |
| 26.4 | 65.10 .43 | 79.7 2.8 | 12.52 .09 | 19.4 −0.1 | 9.00 .09 | 44.8 0.7 | 8.14 .42 | 47.2 2.9 |
| Oct. 6.4 | 64.64 .50 | 82.3 2.4 | 12.42 .11 | 19.6 0.2 | 8.90 .11 | 45.4 0.5 | 7.69 .49 | 50.0 2.5 |
| 16.3 | 64.11 .55 | 84.5 1.9 | 12.30 .13 | 19.9 0.3 | 8.78 .13 | 45.8 +0.2 | 7.17 .55 | 52.3 2.1 |
| 26.3 | 63.54 .59 | 86.1 1.4 | 12.17 .13 | 20.2 0.4 | 8.65 .13 | 45.9 0.0 | 6.60 .59 | 54.1 1.6 |
| Nov. 5.3 | 62.95 .61 | 87.3 0.8 | 12.04 .13 | 20.7 0.5 | 8.52 .14 | 45.8 −0.2 | 6.00 .61 | 55.5 1.1 |
| 15.2 | 62.34 .61 | 87.8 +0.3 | 11.91 .12 | 21.1 0.5 | 8.39 .13 | 45.4 0.5 | 5.38 .62 | 56.2 +0.5 |
| 25.2 | 61.74 .59 | 87.8 −0.3 | 11.80 .11 | 21.7 0.5 | 8.26 .12 | 44.9 0.7 | 4.75 .62 | 56.4 −0.1 |
| Dec. 5.2 | 61.16 .56 | 87.1 0.9 | 11.70 .09 | 22.2 0.5 | 8.15 .10 | 44.1 0.8 | 4.15 .59 | 56.0 0.7 |
| 15.2 | 60.63 .51 | 85.9 1.5 | 11.62 .07 | 22.7 0.5 | 8.06 .08 | 43.2 1.0 | 3.58 .55 | 55.0 1.3 |
| 25.1 | 60.15 .44 | 84.2 2.0 | 11.57 .04 | 23.2 0.5 | 8.00 .06 | 42.1 1.1 | 3.07 .48 | 53.4 1.9 |
| 35.1 | 59.74 −.36 | 81.9 −2.5 | 11.54 −.01 | 23.6 −0.4 | 7.96 −.03 | 41.0 −1.2 | 2.62 −.40 | 51.3 −2.4 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | μ Capricorni. | | *79 Draconis. | | α Aquarii. | | α Gruis. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* |
| | h m<br>21 46 | ° ′<br>−14 7 | h m<br>21 51 | ° ′<br>+73 6 | h m<br>21 59 | ° ′<br>−0 54 | h m<br>22 0 | ° ′<br>−47 33 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.1 | 31.19 −.03 | 72.3 −0.2 | 14.64 −.54 | 65.5 −2.0 | 23.97 −.04 | 82.9 −0.8 | 23.85 −.10 | 53.8 +1.4 |
| 11.1 | 31.17 .00 | 72.4 −0.1 | 14.15 .44 | 63.3 2.5 | 23.94 −.02 | 83.6 0.7 | 23.78 .05 | 52.3 1.6 |
| 21.1 | 31.18 +.02 | 72.4 +0.1 | 13.76 .33 | 60.6 2.8 | 23.93 +.01 | 84.3 0.7 | 23.75 −.01 | 50.5 1.9 |
| 31.1 | 31.22 .05 | 72.3 0.2 | 13.49 .20 | 57.6 3.1 | 23.95 .04 | 84.9 0.6 | 23.76 +.04 | 48.5 2.1 |
| Feb. 10.0 | 31.29 .09 | 72.0 0.4 | 13.36 −.07 | 54.5 3.2 | 24.00 .07 | 85.4 0.4 | 23.83 .08 | 46.2 2.4 |
| 20.0 | 31.39 .12 | 71.6 0.5 | 13.35 +.07 | 51.3 3.2 | 24.08 .10 | 85.8 0.3 | 23.93 .13 | 43.8 2.5 |
| Mar. 1.0 | 31.52 .15 | 71.0 0.7 | 13.49 .21 | 48.2 3.1 | 24.19 .13 | 86.0 −0.1 | 24.09 .18 | 41.2 2.6 |
| 10.9 | 31.68 .18 | 70.2 0.9 | 13.76 .34 | 45.2 2.8 | 24.34 .16 | 85.9 +0.2 | 24.28 .22 | 38.6 2.6 |
| 20.9 | 31.88 .21 | 69.2 1.1 | 14.17 .46 | 42.6 2.4 | 24.51 .19 | 85.5 0.5 | 24.52 .26 | 36.0 2.6 |
| 30.9 | 32.10 .24 | 67.9 1.3 | 14.69 .57 | 40.4 2.0 | 24.72 .22 | 84.9 0.7 | 24.81 .30 | 33.4 2.6 |
| Apr. 9.9 | 32.35 .27 | 66.6 1.5 | 15.31 .66 | 38.7 1.4 | 24.95 .25 | 84.1 1.0 | 25.13 .34 | 30.9 2.5 |
| 19.8 | 32.63 .29 | 65.0 1.6 | 16.01 .73 | 37.5 0.9 | 25.21 .27 | 82.9 1.3 | 25.49 .38 | 28.5 2.3 |
| 29.8 | 32.93 .31 | 63.4 1.7 | 16.76 .78 | 37.0 −0.2 | 25.50 .30 | 81.5 1.5 | 25.88 .40 | 26.3 2.1 |
| May 9.8 | 33.25 .32 | 61.6 1.7 | 17.55 .80 | 37.0 +0.4 | 25.80 .31 | 79.9 1.7 | 26.29 .42 | 24.3 1.9 |
| 19.8 | 33.57 .33 | 59.8 1.8 | 18.35 .79 | 37.7 1.0 | 26.11 .32 | 78.2 1.9 | 26.72 .44 | 22.6 1.6 |
| 29.7 | 33.91 .33 | 58.1 1.8 | 19.13 .77 | 39.0 1.6 | 26.44 .32 | 76.3 2.0 | 27.16 .44 | 21.1 1.3 |
| June 8.7 | 34.23 .32 | 56.3 1.7 | 19.87 .72 | 40.9 2.1 | 26.75 .32 | 74.3 2.0 | 27.60 .43 | 20.1 0.9 |
| 18.7 | 34.55 .31 | 54.7 1.6 | 20.56 .65 | 43.2 2.6 | 27.06 .30 | 72.2 2.0 | 28.03 .42 | 19.4 0.5 |
| 28.6 | 34.85 .28 | 53.2 1.4 | 21.16 .56 | 45.9 3.0 | 27.35 .28 | 70.3 1.9 | 28.43 .39 | 19.1 +0.1 |
| July 8.6 | 35.12 .25 | 51.9 1.2 | 21.68 .46 | 49.1 3.3 | 27.62 .25 | 68.4 1.8 | 28.80 .35 | 19.2 −0.3 |
| 18.6 | 35.35 .22 | 50.8 1.0 | 22.09 .35 | 52.5 3.5 | 27.85 .22 | 66.6 1.7 | 29.13 .30 | 19.6 0.7 |
| 28.6 | 35.55 .18 | 49.9 0.8 | 22.38 .23 | 56.1 3.7 | 28.05 .18 | 65.0 1.5 | 29.40 .25 | 20.4 1.0 |
| Aug. 7.5 | 35.70 .13 | 49.3 0.5 | 22.55 +.11 | 59.8 3.8 | 28.20 .14 | 63.6 1.3 | 29.62 .19 | 21.6 1.3 |
| 17.5 | 35.81 .09 | 48.9 0.3 | 22.60 −.01 | 63.6 3.8 | 28.32 .09 | 62.4 1.1 | 29.78 .13 | 23.1 1.6 |
| 27.5 | 35.87 +.04 | 48.7 +0.1 | 22.54 .13 | 67.4 3.7 | 28.39 .05 | 61.4 0.9 | 29.88 +.06 | 24.7 1.7 |
| Sept. 6.5 | 35.89 .00 | 48.7 −0.1 | 22.35 .24 | 71.1 3.6 | 28.42 +.01 | 60.6 0.7 | 29.91 .00 | 26.5 1.8 |
| 16.4 | 35.87 −.04 | 48.9 0.3 | 22.05 .35 | 74.5 3.4 | 28.40 −.03 | 60.0 0.5 | 29.87 −.06 | 28.4 1.9 |
| 26.4 | 35.81 .07 | 49.2 0.4 | 21.65 .45 | 77.7 3.1 | 28.35 .06 | 59.7 0.3 | 29.79 .11 | 30.2 1.8 |
| Oct. 6.4 | 35.72 .10 | 49.6 0.5 | 21.16 .53 | 80.6 2.7 | 28.28 .09 | 59.5 +0.1 | 29.65 .16 | 32.0 1.7 |
| 16.3 | 35.61 .12 | 50.1 0.5 | 20.59 .60 | 83.2 2.3 | 28.18 .11 | 59.6 −0.1 | 29.48 .19 | 33.6 1.5 |
| 26.3 | 35.49 .13 | 50.7 0.6 | 19.96 .66 | 85.2 1.8 | 28.06 .12 | 59.7 0.3 | 29.28 .21 | 34.9 1.2 |
| Nov. 5.3 | 35.36 .13 | 51.3 0.6 | 19.27 .70 | 86.7 1.3 | 27.94 .13 | 60.0 0.4 | 29.07 .22 | 35.9 0.9 |
| 15.3 | 35.23 .12 | 51.8 0.5 | 18.57 .71 | 87.7 0.7 | 27.81 .12 | 60.5 0.5 | 28.85 .22 | 36.6 0.5 |
| 25.2 | 35.11 .11 | 52.3 0.5 | 17.86 .71 | 88.1 +0.1 | 27.70 .11 | 61.0 0.6 | 28.63 .21 | 36.9 −0.1 |
| Dec. 5.2 | 35.00 .10 | 52.7 0.4 | 17.15 .69 | 87.9 −0.5 | 27.59 .10 | 61.6 0.6 | 28.44 .19 | 36.7 +0.4 |
| 15.2 | 34.92 .07 | 53.1 0.3 | 16.48 .65 | 87.1 1.1 | 27.50 .08 | 62.3 0.7 | 28.27 .16 | 36.2 0.7 |
| 25.2 | 34.85 .05 | 53.4 0.2 | 15.87 .58 | 85.7 1.7 | 27.43 .06 | 63.0 0.7 | 28.13 .12 | 35.3 1.1 |
| 35.1 | 34.82 −.02 | 53.5 −0.1 | 15.32 −.50 | 83.8 −2.2 | 27.38 −.04 | 63.7 −0.7 | 28.03 −.07 | 34.0 +1.4 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | θ Aquarii. | | π Aquarii. | | η Aquarii. | | *226 Cephei (B.) | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *North.* |
| | h m<br>22 10 | ° ′<br>-8 23 | h m<br>22 18 | ° ′<br>+0 44 | h m<br>22 28 | ° ′<br>-0 45 | h m<br>22 29 | ° ′<br>+75 34 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.2 | 16.58 -.05 | 67.3 -0.4 | 55.82 -.06 | 51.1 -0.8 | 58.27 -.07 | 26.3 -0.7 | 60.42 -.71 | 87.3 -1.5 |
| 11.1 | 16.54 -.03 | 67.7 0.3 | 55.77 .04 | 50.3 0.8 | 58.22 .04 | 27.0 0.7 | 59.75 .63 | 85.5 2.0 |
| 21.1 | 16.53 .00 | 67.9 0.3 | 55.75 -.01 | 49.6 0.7 | 58.19 -.02 | 27.7 0 6 | 59.18 .52 | 83.3 2.5 |
| 31.1 | 16.54 +.03 | 68.1 -0.1 | 55.75 +.02 | 48.9 0.6 | 58.18 +.01 | 28.2 0.5 | 58.73 .38 | 80.6 2.8 |
| Feb. 10.0 | 16.59 .06 | 68.2 0.0 | 55.78 .04 | 48.4 0.5 | 58.20 .04 | 28.7 0.4 | 58.41 .24 | 77.7 3.0 |
| 20.0 | 16.66 .09 | 68.0 +0.2 | 55.84 .07 | 48.0 0.3 | 58.25 .06 | 29.0 -0.2 | 58.26 -.08 | 74.6 3.2 |
| Mar 1.0 | 16.76 .12 | 67.7 0.4 | 55.93 .11 | 47.7 -0.1 | 58.33 .10 | 29.1 0.0 | 58.26 +.09 | 71.4 3.1 |
| 11.0 | 16.90 .15 | 67.2 0.6 | 56.05 .14 | 47.7 +0.1 | 58.44 .13 | 29.0 +0.2 | 58.43 .25 | 68.4 3.0 |
| 20.9 | 17.06 .18 | 66.4 0.9 | 56.21 .17 | 48.0 0.4 | 58.59 .16 | 28.7 0.5 | 58.76 .41 | 65.5 2.7 |
| 30.9 | 17.26 .22 | 65.4 1.1 | 56.40 .21 | 48.5 0.7 | 58.77 .20 | 28.1 0.8 | 59.24 .55 | 63.0 2.3 |
| Apr. 9.9 | 17.49 .25 | 64.2 1.3 | 56.62 .24 | 49.3 1.0 | 58.98 .23 | 27.2 1.0 | 59.85 .68 | 60.9 1.9 |
| 19.9 | 17.75 .27 | 62.8 1.5 | 56.87 .26 | 50.4 1.2 | 59.23 .26 | 26.0 1.3 | 60.58 .78 | 59.3 1.3 |
| 29.8 | 18.03 .29 | 61.2 1.7 | 57.14 .29 | 51.8 1.5 | 59.50 .28 | 24.6 1.5 | 61.39 .85 | 58 2 0.8 |
| May 9.8 | 18.33 .31 | 59.5 1.8 | 57.44 .31 | 53.4 1.7 | 59.79 .30 | 23.0 1.7 | 62.28 .90 | 57.8 -0.2 |
| 19.8 | 18.65 .32 | 57.6 1.9 | 57.75 .32 | 55.1 1.9 | 60.10 .32 | 21.2 1.9 | 63.19 .92 | 57.9 +0.5 |
| 29.7 | 18.98 .33 | 55.7 1.9 | 58.07 .32 | 57.1 2.0 | 60.42 .32 | 19.3 2.0 | 64.12 .92 | 58.7 1.0 |
| June 8.7 | 19.30 .32 | 53.8 1.9 | 58.39 .32 | 59.1 2.1 | 60.74 .32 | 17.2 2.0 | 65.02 .88 | 60.0 1.6 |
| 18.7 | 19.62 .31 | 51.9 1.8 | 58.71 .31 | 61.2 2.1 | 61.06 .31 | 15.2 2.1 | 65.88 .83 | 61.8 2.1 |
| 28.7 | 19.92 .29 | 50.1 1.7 | 59.01 .29 | 63.2 2.0 | 61.36 .30 | 13.1 2.0 | 66.66 .75 | 64.2 2.6 |
| July 8.6 | 20.20 .26 | 48.5 1.6 | 59.28 .26 | 65.2 1.9 | 61.65 .27 | 11.2 1.9 | 67.36 .65 | 67.0 3.0 |
| 18.6 | 20.45 .23 | 47.0 1.4 | 59.53 .23 | 67.1 1.8 | 61.90 .24 | 9.3 1.8 | 67.96 .54 | 70.1 3.3 |
| 28.6 | 20.66 .19 | 45.8 1.2 | 59.74 .19 | 68.8 1.7 | 62.12 .20 | 7.7 1.6 | 68.43 .41 | 73.5 3.5 |
| Aug. 7.5 | 20.83 .15 | 44.7 0.9 | 59.91 .15 | 70.4 1.5 | 62.30 .16 | 6.2 1.4 | 68.78 .28 | 77.2 3.7 |
| 17.5 | 20.96 .11 | 43.9 0.8 | 60.04 .11 | 71.7 1.2 | 62.44 .12 | 4.9 1.2 | 68.99 +.14 | 81.0 3.8 |
| 27.5 | 21.04 .06 | 43.4 0.5 | 60.13 .07 | 72.8 1.0 | 62.54 .08 | 3.9 1.0 | 69.06 .00 | 84.8 3.8 |
| Sept. 6.5 | 21.08 +.02 | 43.0 +0.2 | 60.18 +.03 | 73.7 0.8 | 62.60 +.04 | 3.0 0.7 | 69.00 -.13 | 88.6 3.8 |
| 16.4 | 21.08 -.02 | 42.9 0.0 | 60.19 -.01 | 74.4 0.6 | 62.62 .00 | 2.4 0.5 | 68.80 .26 | 92.3 3.6 |
| 26.4 | 21.04 .05 | 42.9 -0.1 | 60.15 .05 | 74.8 0.4 | 62.59 -.04 | 2.1 0.3 | 68.48 .38 | 95.9 3.4 |
| Oct. 6.4 | 20.97 .08 | 43.1 0.3 | 60.09 .08 | 75.1 +0.2 | 62.54 .07 | 1.9 +0.1 | 68.04 .50 | 99.1 3.1 |
| 16.4 | 20.88 .10 | 43.5 0.4 | 60.01 .10 | 75.2 0.0 | 62.46 .09 | 1.9 -0.1 | 67.49 .59 | 102.1 2.8 |
| 26.3 | 20.77 .12 | 43.9 0.5 | 59.90 .11 | 75.1 -0.2 | 62.37 .10 | 2.1 0.2 | 66.86 .68 | 104.7 2.4 |
| Nov. 5.3 | 20.65 .12 | 44.4 0.5 | 59.79 .12 | 74.8 0.3 | 62.26 .11 | 2.4 0.4 | 66.15 .74 | 106.8 1.9 |
| 15.3 | 20.53 .12 | 45.0 0.5 | 59.67 .12 | 74.4 0.5 | 62.14 .12 | 2.8 0.5 | 65.38 .79 | 108.4 1.3 |
| 25.2 | 20.41 .11 | 45.5 0.5 | 59.55 .11 | 73.9 0.6 | 62.03 .11 | 3.3 0.6 | 64.57 .82 | 109.4 0.7 |
| Dec. 5.2 | 20.30 .10 | 46.0 0.5 | 59.45 .10 | 73.3 0.6 | 61.92 .10 | 3.9 0.6 | 63.75 .82 | 109.8 +0.1 |
| 15.2 | 20.21 .08 | 46.6 0.5 | 59.35 .09 | 72.6 0.7 | 61.82 .09 | 4.6 0.7 | 62.94 .80 | 109.6 -0.5 |
| 25.2 | 20.14 .06 | 47.1 0.5 | 59.27 .07 | 71.9 0.7 | 61.74 .08 | 5.2 0.7 | 62.16 .75 | 108.8 1.1 |
| 35.1 | 20.08 -.04 | 47.5 -0.4 | 59.21 -.05 | 71.1 -0.7 | 61.68 -.05 | 5.9 -0.7 | 61.45 -.68 | 107.4 -1.7 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ζ Pegasi. | | *ι Cephei. | | λ Aquarii. | | α Piscis Australis. (*Fomalhaut.*) | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *South.* | Right Ascension. | Declination *South.* |
| | h m<br>22 35 | ° ′<br>+10 10 | h m<br>22 45 | ° ′<br>+65 32 | h m<br>22 46 | ° ′<br>−8 13 | h m<br>22 50 | ° ′<br>−30 16 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.2 | 15.77 −.07 | 64.0 −1.0 | 13.33 −.39 | 66.9 −1.4 | 8.01 − 07 | 86.0 −0.5 | 47.28 −.09 | 56.4 +0.3 |
| 11.1 | 15.71 .05 | 62.9 1.1 | 12.96 .35 | 65.3 1.9 | 7.95 .05 | 86.4 0.4 | 47.20 .07 | 55.9 0.6 |
| 21.1 | 15.66 .03 | 61.8 1.1 | 12.64 .29 | 63.1 2.4 | 7.91 .03 | 86.7 0.2 | 47.14 .04 | 55.2 0.9 |
| 31.1 | 15.65 −.01 | 60.7 1.1 | 12.39 .22 | 60.6 2.7 | 7.89 −.01 | 86.8 −0.1 | 47.11 −.02 | 54.2 1.1 |
| Feb. 10.1 | 15.65 +.02 | 59.7 1.0 | 12.21 .14 | 57.8 2.9 | 7.90 +.02 | 86.8 +0.1 | 47.11 +.02 | 52.9 1.4 |
| 20.0 | 15.69 .05 | 58.7 0.9 | 12.12 −.05 | 54.8 3.0 | 7.93 .05 | 86.7 0.3 | 47.15 .05 | 51.4 1.6 |
| Mar. 1.0 | 15.76 .09 | 58.0 0.7 | 12.13 +.05 | 51.8 3.0 | 8.00 .08 | 86.3 0.5 | 47.21 .09 | 49.7 1.8 |
| 11.0 | 15.86 .12 | 57.4 0.4 | 12.22 .15 | 48.8 2.9 | 8.09 .11 | 85.7 0.7 | 47.31 .12 | 47.8 2.0 |
| 20.9 | 16.00 .16 | 57.1 −0.1 | 12.42 .24 | 46.1 2.6 | 8.22 .15 | 84.9 0.9 | 47.45 .16 | 45.8 2.1 |
| 30.9 | 16.18 .19 | 57.2 +0.2 | 12.71 .33 | 43.7 2.2 | 8.39 .18 | 83.9 1.2 | 47.63 .20 | 43.6 2.2 |
| Apr. 9.9 | 16.39 .23 | 57.5 0.5 | 13.08 .41 | 41.7 1.8 | 8.59 .22 | 82.6 1.4 | 47.85 .23 | 41.3 2.3 |
| 19.9 | 16.63 .26 | 58.2 0.9 | 13.52 .48 | 40.2 1.3 | 8.82 .25 | 81.1 1.6 | 48.10 .27 | 38.9 2.4 |
| 29.8 | 16.90 .28 | 59.2 1.2 | 14.03 .54 | 39.2 0.7 | 9.09 .28 | 79.4 1.8 | 48.39 .30 | 36.6 2.3 |
| May 9.8 | 17.19 .30 | 60.6 1.5 | 14.59 .58 | 38.8 −0.2 | 9.37 .30 | 77.6 1.9 | 48.70 .33 | 34.3 2.3 |
| 19.8 | 17.50 .32 | 62.2 1.7 | 15.18 .60 | 39.0 +0.5 | 9.68 .31 | 75.7 1.9 | 49.04 .35 | 32.1 2.1 |
| 29.8 | 17.82 .32 | 64.0 2.0 | 15.78 .60 | 39.8 1.1 | 10.00 .33 | 73.7 2.0 | 49.39 .36 | 30.1 2.0 |
| June 8.7 | 18.14 .32 | 66.1 2.1 | 16.38 .59 | 41.1 1.6 | 10.33 .33 | 71.7 2.0 | 49.75 .36 | 28.2 1.8 |
| 18.7 | 18.46 .31 | 68.3 2.2 | 16.96 .56 | 43.0 2.1 | 10.65 .32 | 69.7 2.0 | 50.11 .36 | 26.6 1.5 |
| 28.7 | 18.77 .30 | 70.5 2.3 | 17.50 .52 | 45.3 2.6 | 10.97 .31 | 67.8 1.8 | 50.47 .34 | 25.3 1.2 |
| July 8.6 | 19.05 .27 | 72.8 2.3 | 18.00 .47 | 48.1 2.9 | 11.26 .28 | 66.0 1.7 | 50.80 .32 | 24.2 0.9 |
| 18.6 | 19.31 .24 | 75.1 2.2 | 18.43 .40 | 51.2 3.2 | 11.53 .25 | 64.4 1.5 | 51.11 .29 | 23.6 0.5 |
| 28.6 | 19.53 .20 | 77.2 2.1 | 18.80 .33 | 54.6 3.5 | 11.77 .22 | 63.1 1.3 | 51.38 .25 | 23.2 +0.2 |
| Aug. 7.6 | 19.72 .16 | 79.3 2.0 | 19.08 .24 | 58.1 3.6 | 11.97 .18 | 61.9 1.0 | 51.61 .21 | 23.2 −0.2 |
| 17.5 | 19.86 .12 | 81.2 1.8 | 19.28 .16 | 61.8 3.7 | 12.13 .14 | 61.1 0.8 | 51.79 .16 | 23.6 0.5 |
| 27.5 | 19.96 .08 | 82.9 1.6 | 19.40 +.08 | 65.6 3.7 | 12.25 .10 | 60.4 0.5 | 51.93 .11 | 24.2 0.8 |
| Sept. 6.5 | 20.02 +.04 | 84.3 1.4 | 19.43 −.01 | 69.3 3.7 | 12.32 .05 | 60.0 0.3 | 52.02 .06 | 25.1 1.0 |
| 16.5 | 20.04 .00 | 85.6 1.1 | 19.38 .09 | 72.9 3.5 | 12.36 +.02 | 59.9 +0.1 | 52.06 +.02 | 26.2 1.2 |
| 26.4 | 20.02 −.03 | 86.6 0.9 | 19.26 .16 | 76.3 3.3 | 12.35 −.02 | 59.9 −0.1 | 52.05 −.03 | 27.5 1.3 |
| Oct. 6.4 | 19.97 .06 | 87.3 0.7 | 19.06 .23 | 79.5 3.0 | 12.32 .05 | 60.1 0.3 | 52.01 .07 | 28.8 1.4 |
| 16.4 | 19.89 .09 | 87.9 0.4 | 18.79 .29 | 82.3 2.7 | 12.25 .08 | 60.5 0.4 | 51.93 .09 | 30.2 1.3 |
| 26.3 | 19.80 .10 | 88.1 +0.2 | 18.47 .35 | 84.8 2.3 | 12.16 .10 | 61.0 0.5 | 51.82 .12 | 31.5 1.3 |
| Nov. 5.3 | 19.69 .11 | 88.2 −0.1 | 18.11 .39 | 86.9 1.8 | 12.06 .11 | 61.5 0.6 | 51.69 .13 | 32.7 1.1 |
| 15.3 | 19.57 .12 | 88.0 0.3 | 16.70 .42 | 88.4 1.3 | 11.95 .11 | 62.1 0.6 | 51.55 .14 | 33.7 0.9 |
| 25.3 | 19.46 .12 | 87.7 0.5 | 17.28 .43 | 89.4 0.7 | 11.84 .11 | 62.7 0 6 | 51.41 .14 | 34.5 0.7 |
| Dec. 5.2 | 19.34 .11 | 87.1 0.6 | 16.84 .44 | 89.8 +0.1 | 11.73 .11 | 63.3 0.6 | 51.27 .13 | 35.0 0.4 |
| 15.2 | 19.24 .10 | 86.4 0.8 | 16.40 .43 | 89.6 −0.5 | 11.63 .10 | 63.9 0.5 | 51.14 .12 | 35.3 −0.2 |
| 25.2 | 19.14 .08 | 85.5 0.9 | 15.98 .41 | 88.8 1.1 | 11.54 .08 | 64.4 0.5 | 51.03 .11 | 35.3 +0.2 |
| 35.2 | 19.07 −.06 | 84.5 −1.1 | 15.59 −.37 | 87.5 −1.6 | 11.47 −.06 | 64.9 −0.4 | 50.93 −.09 | 35.0 +0.5 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *a* Pegasi. (*Markab.*) | | *o Cephei. | | *θ* Piscium. | | *ι* Piscium. | |
|---|---|---|---|---|---|---|---|---|
| | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>22 58 | ° ′<br>+14 32 | h m<br>23 13 | ° ′<br>+67 25 | h m<br>23 21 | ° ′<br>+5 41 | h m<br>23 33 | ° ′<br>+4 57 |
| | s | ″ | s | ″ | s | ″ | s | ″ |
| Jan. 1.2 | 34.32 −.08 | 20.3 −1.0 | 29.82 −.45 | 73.3 −1.0 | 40.13 −.09 | 53.2 −0.8 | 33.95 −.09 | 15.4 −0.7 |
| 11.2 | 34.24 .07 | 19.3 1.1 | 29.38 .41 | 72.0 1.6 | 40.04 .08 | 52.4 0.8 | 33.86 .08 | 14.6 0.8 |
| 21.1 | 34.18 .05 | 18.1 1.2 | 29.00 .36 | 70.2 2.1 | 39.97 .06 | 51.6 0.8 | 33 79 .07 | 13.9 0.8 |
| 31.1 | 34.14 −.03 | 16.9 1.2 | 28.67 .29 | 67.9 2.5 | 39.92 .04 | 50.8 0.8 | 33.73 .05 | 13.1 0.7 |
| Feb. 10.1 | 34.12 .00 | 15.7 1.2 | 28.41 .21 | 65.3 2.7 | 39.89 −.02 | 50.1 0.7 | 33.69 −.03 | 12.5 0.6 |
| 20.1 | 34.13 +.03 | 14.5 1.1 | 28.25 .12 | 62.5 2.9 | 39.88 +.01 | 49.5 0.5 | 33.68 .00 | 11.9 0.5 |
| Mar. 1.0 | 34.18 .06 | 13.5 0.9 | 28.18 −.02 | 59.5 3.0 | 39.91 .04 | 49.1 0.4 | 33.69 +.03 | 11.5 0.3 |
| 11.0 | 34.25 .10 | 12.8 0.7 | 28.21 +.09 | 56.6 2.9 | 39.97 .07 | 48.9 −0.1 | 33.74 .06 | 11.3 −0.1 |
| 21.0 | 34.37 .14 | 12.2 0.4 | 28.35 .19 | 53.7 2.7 | 40.06 .11 | 48.8 +0.1 | 33.82 .10 | 11.3 +0.2 |
| 30.9 | 34.56 .17 | 12.0 −0.1 | 28.59 .29 | 51.1 2.4 | 40.19 .15 | 49.1 0.4 | 33 94 .14 | 11.6 0.4 |
| Apr. 9.9 | 34.72 .21 | 12.1 +0.3 | 28.93 .39 | 48.9 2.0 | 40.36 .19 | 49.7 0.7 | 34.09 .18 | 12.2 0.7 |
| 19.9 | 34.94 .24 | 12.5 0.6 | 29.37 .47 | 47.1 1.6 | 40.56 .22 | 50.5 1.0 | 34.29 .22 | 13.0 1.0 |
| 29.9 | 35.20 .27 | 13.3 1.0 | 29.87 .54 | 45.8 1.0 | 40.80 .25 | 51.6 1.3 | 34.52 .25 | 14.2 1.3 |
| May 9.8 | 35.49 .30 | 14.5 1.3 | 30.44 .59 | 45.0 −0.5 | 41.07 .28 | 53.0 1.5 | 34.78 .28 | 15.6 1.5 |
| 19.8 | 35.79 .32 | 15.9 1.6 | 31.06 .63 | 44.8 +0.1 | 41.36 .30 | 54.6 1.8 | 35.07 .30 | 17.2 1.8 |
| 29.8 | 36.12 .33 | 17.6 1.9 | 31.70 .65 | 45.2 0.7 | 41.67 .32 | 56.5 1.9 | 35.38 .32 | 19.1 1.9 |
| June 8.8 | 36.44 .33 | 19.6 2.1 | 32.35 .65 | 46.1 1.2 | 41.99 .32 | 58.5 2.1 | 35.70 .33 | 21.0 2.0 |
| 18.7 | 36.77 .32 | 21.8 2.2 | 32.99 .63 | 47.7 1.8 | 42.32 .32 | 60.6 2.1 | 36.02 .33 | 23.1 2.1 |
| 28.7 | 37.09 .31 | 24.1 2.3 | 33.60 .59 | 49.7 2.3 | 42.64 .31 | 62.8 2.2 | 36.35 .32 | 25.3 2.2 |
| July 8.7 | 37.39 .29 | 26.4 2.4 | 34.17 .54 | 52.1 2.7 | 42.94 .30 | 64.9 2.2 | 36.66 .30 | 27.4 2.1 |
| 18.6 | 37.66 .26 | 28.8 2.4 | 34.69 .48 | 55.0 3.0 | 43.23 .27 | 67.0 2.1 | 36.95 .28 | 29.5 2.0 |
| 28.6 | 37.90 .22 | 31.1 2.3 | 35.13 .41 | 58.2 3.3 | 43.48 .24 | 69.0 1.9 | 37.21 .25 | 31.4 1.9 |
| Aug. 7.6 | 38.10 .19 | 33.4 2.2 | 35.50 .33 | 61.6 3.5 | 43.70 .20 | 70.9 1.8 | 37.45 .22 | 33.2 1.7 |
| 17.6 | 38.27 .15 | 35.5 2.0 | 35.79 .25 | 65.2 3.7 | 43.89 .17 | 72.6 1.6 | 37.65 .18 | 34.9 1.5 |
| 27.5 | 38.39 .10 | 37.4 1.8 | 35.99 .16 | 68.9 3.7 | 44.04 .13 | 74.0 1.4 | 37.80 .14 | 36.3 1.3 |
| Sept. 6.5 | 38.48 .06 | 39.2 1.6 | 36.10 +.07 | 72.7 3.7 | 44.15 .09 | 75.3 1.1 | 37.92 .10 | 37.5 1.1 |
| 16.5 | 38.52 +.02 | 40.7 1.4 | 36.12 −.02 | 76.4 3.7 | 44.21 .05 | 76.3 0.9 | 38.00 .06 | 38.5 0.9 |
| 26.5 | 38.52 −.01 | 42.0 1.2 | 36.06 .10 | 80.0 3.5 | 44.24 +.01 | 77.1 0.7 | 38.05 +.02 | 39.2 0.6 |
| Oct. 6.4 | 38.49 .05 | 43.0 0.9 | 35.92 .18 | 83.4 3.3 | 44.24 −.02 | 77.7 0.5 | 38.05 −.01 | 39.7 0.4 |
| 16.4 | 38.43 .07 | 43.8 0.7 | 35.70 .25 | 86.5 3.0 | 44.20 .05 | 78.0 0.2 | 38.03 .04 | 40.0 +0.2 |
| 26.4 | 38.35 .09 | 44.3 0.4 | 35.42 .32 | 89.4 2.6 | 44.14 .07 | 78.1 +0.1 | 37.98 .06 | 40.1 0.0 |
| Nov. 5.3 | 38.25 .11 | 44.6 +0.2 | 35.07 .37 | 91.7 2.2 | 44.07 .09 | 78.1 −0.1 | 37.92 .08 | 40.0 −0.2 |
| 15.3 | 38 14 .11 | 44.6 −0.1 | 34.68 .41 | 93.6 1.7 | 43.97 .10 | 77.9 0.3 | 37.83 .09 | 39.8 0.3 |
| 25.3 | 38.03 .12 | 44.4 0.3 | 34.25 .45 | 95.0 1.1 | 43.87 .10 | 77.5 0.4 | 37.74 .10 | 39.4 0.5 |
| Dec. 5.3 | 37.91 .11 | 44.0 0.5 | 33.79 .46 | 95.8 +0.5 | 43.77 .10 | 77.0 0.6 | 37.64 .10 | 38.9 0.6 |
| 15.2 | 37.80 .11 | 43.4 0.7 | 33.33 .47 | 96.1 −0.1 | 43.67 .10 | 76.4 0.6 | 37.54 .10 | 38.2 0.6 |
| 25.2 | 37.70 .10 | 42.5 0.9 | 32.86 .46 | 95.7 0.7 | 43.57 .10 | 75.7 0.7 | 37.44 .10 | 37.6 0.7 |
| 35.2 | 37.61 −.08 | 41.5 −1.1 | 32.41 −.44 | 94.8 −1.2 | 43.48 −.10 | 74.9 −0.8 | 37.35 −.09 | 36.8 −0.8 |

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | *γ Cephei. | | *Groombridge 4163. | | ω Piscium. | |
|---|---|---|---|---|---|---|
| | Right Ascension. | Declinatian *North.* | Right Ascension. | Declination *North.* | Right Ascension. | Declination *North.* |
| | h m<br>23 34 | ° ′<br>+76 56 | h m<br>23 48 | ° ′<br>+73 43 | h m<br>23 52 | ° ′<br>+6 10 |
| | s | ″ | s | ″ | s | ″ |
| Jan. 1.2 | 12.03 −.86 | 42.8 −0.6 | 46.12 −.68 | 30.4 −0.4 | 56.31 −.10 | 37.5 −0.7 |
| 11.2 | 11.19 .82 | 41.9 1.2 | 45.46 .65 | 29.7 1.0 | 56.22 .09 | 36.7 0.8 |
| 21.2 | 10.41 .74 | 40.5 1.7 | 44.84 .59 | 28.3 1.6 | 56.13 .08 | 36.0 0.7 |
| 31.1 | 9.73 .63 | 38.5 2.2 | 44.28 .52 | 26.5 2.1 | 56.06 .07 | 35.3 0.7 |
| Feb. 10.1 | 9.16 .49 | 36.1 2.6 | 43.81 .42 | 24.2 2.5 | 56.00 .04 | 34.6 0.6 |
| 20.1 | 8.74 .34 | 33.4 2.9 | 43.45 .30 | 21.6 2.8 | 55.97 −.02 | 34.0 0.5 |
| Mar. 1.0 | 8.49 −.17 | 30.4 3.0 | 43.22 .16 | 18.7 3.0 | 55.97 +.01 | 33.6 0.3 |
| 11.0 | 8.41 +.02 | 27.3 3.1 | 43.12 −.02 | 15.7 3.0 | 55.99 .04 | 33.4 −0.1 |
| 21.0 | 8.51 .20 | 24.3 3.0 | 43.18 +.12 | 12.7 2.9 | 56.05 .08 | 33.3 +0.1 |
| 31.0 | 8.80 .37 | 21.5 2.7 | 43.37 .27 | 9.9 2.7 | 56.15 .12 | 33.5 0.4 |
| Apr. 9.9 | 9.26 .54 | 18.9 2.4 | 43.71 .41 | 7.3 2.4 | 56.29 .16 | 34.0 0.6 |
| 19.9 | 9.87 .69 | 16.7 2.0 | 44.18 .54 | 5.0 2.1 | 56.47 .20 | 34.8 0.9 |
| 29.9 | 10.62 .81 | 14.9 1.5 | 44.78 .65 | 3.2 1.6 | 56.68 .23 | 35.8 1.2 |
| May 9.9 | 11.49 .90 | 13.6 1.0 | 45.47 .73 | 1.9 1.1 | 56.93 .27 | 37.2 1.5 |
| 19.8 | 12.44 .98 | 13.0 −0.4 | 46.23 .80 | 1.1 −0.5 | 57.21 .29 | 38.7 1.7 |
| 29.8 | 13.44 1.02 | 12.9 +0.2 | 47.06 .84 | 0.9 +0.1 | 57.51 .31 | 40.5 1.9 |
| June 8.8 | 14.47 1.03 | 13.3 0.8 | 47.91 .86 | 1.2 0.6 | 57.83 .32 | 42.5 2.0 |
| 18.7 | 15.49 1.01 | 14.4 1.3 | 48.77 .85 | 2.2 1.2 | 58.16 .33 | 44.5 2.1 |
| 28.7 | 16.49 .97 | 16.0 1.9 | 49.61 .83 | 3.6 1.7 | 58.48 .32 | 46.7 2.2 |
| July 8.7 | 17.42 .90 | 18.1 2.3 | 50.41 .78 | 5.6 2.2 | 58.80 .31 | 48.8 2.1 |
| 18.7 | 18.28 .81 | 20.6 2.8 | 51.16 .71 | 8.0 2.6 | 59.10 .29 | 50.9 2.1 |
| 28.6 | 19.04 .70 | 23.5 3.1 | 51.83 .63 | 10.8 3.0 | 59.37 .26 | 52.9 1.9 |
| Aug. 7.6 | 19.68 .58 | 26.8 3.4 | 52.41 .53 | 14.1 3.3 | 59.62 .23 | 54.8 1.8 |
| 17.6 | 20.19 .45 | 30.3 3.6 | 52.89 .43 | 17.4 3.5 | 59.83 .19 | 56.5 1.6 |
| 27.6 | 20.57 .31 | 34.0 3.8 | 53.27 .32 | 21.1 3.7 | 60.01 .16 | 58.0 1.4 |
| Sept. 6.5 | 20.80 .16 | 37.9 3.9 | 53.53 .21 | 24.8 3.8 | 60.15 .12 | 59.3 1.2 |
| 16.5 | 20.90 +.02 | 41.7 3.8 | 53.68 +.09 | 28.6 3.8 | 60.25 .08 | 60.4 0.9 |
| 26.5 | 20.84 −.12 | 45.5 3.8 | 53.71 −.03 | 32.4 3.7 | 60.31 .04 | 61.2 0.7 |
| Oct. 6.4 | 20.65 .26 | 49.2 3.6 | 53.63 .14 | 36.1 3.6 | 60.34 +.01 | 61.8 0.5 |
| 16.4 | 20.33 .39 | 52.7 3.4 | 53.43 .25 | 39.6 3.4 | 60.33 −.02 | 62.1 0.3 |
| 26.4 | 19.88 .51 | 55.9 3.0 | 53.14 .35 | 42.8 3.1 | 60.30 .04 | 62.3 +0.1 |
| Nov. 5.4 | 19.31 .62 | 58.8 2.6 | 52.75 .44 | 45.7 2.7 | 60.25 .06 | 62.3 −0.1 |
| 15.3 | 18.64 .71 | 61.2 2.2 | 52.27 .52 | 48.2 2.3 | 60.18 .08 | 62.1 0.3 |
| 25.3 | 17.89 .79 | 63.1 1.7 | 51.72 .58 | 50.2 1.8 | 60.09 .09 | 61.8 0.4 |
| Dec. 5.3 | 17.07 .84 | 64.5 1.1 | 51.11 .63 | 51.6 1.2 | 60.00 .10 | 61.3 0.5 |
| 15.3 | 16.22 .87 | 65.2 +0.5 | 50.46 .66 | 52.5 +0.6 | 59.90 .10 | 60.8 0.6 |
| 25.2 | 15.34 .87 | 65.4 −0.2 | 49.79 .67 | 52.8 0.0 | 59.80 .10 | 60.1 0.7 |
| 35.2 | 14.48 −.84 | 64.9 −0.8 | 49.12 −.66 | 52.4 −0.7 | 59.70 −.10 | 59.4 −0.7 |

## AT WASHINGTON MEAN AND APPARENT NOON.

| Date. 1876. | APPARENT RIGHT ASCENSION. | | APPARENT DECLINATION. | | Hourly Motion. Mean Noon. | | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. passing Merid. | Sidereal Time of Mean Noon. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean Noon. | Apparent Noon. | Mean Noon. | Apparent Noon. | Right Ascension. | Declination. | | | | |
| | h m s | s | ° ′ ″ | ″ | s | ″ | m s | ′ ″ | m s | h m s |
| Jan. 1 | 18 46 33.28 | 33.99 | −23 1 34.3 | 33.5 | 11.043 | +12.27 | + 3 44.64 | 16 18.40 | 1 11.09 | 18 42 48.68 |
| 2 | 18 50 58.14 | 58.92 | 22 56 25.7 | 24.7 | 11.028 | 13.43 | 4 12.97 | 18.40 | 11.05 | 18 46 45.24 |
| 3 | 18 55 22.63 | 23.48 | 22 50 49.6 | 48.5 | 11.011 | 14.57 | 4 40.91 | 18.40 | 11.00 | 18 50 41.80 |
| 4 | 18 59 46.72 | 47.66 | 22 44 46 3 | 45.0 | 10.994 | 15.71 | 5 8.46 | 18.40 | 10.95 | 18 54 38.36 |
| 5 | 19 4 10.37 | 11.39 | 22 38 16.0 | 14.5 | 10.976 | 16.83 | 5 35.56 | 18.38 | 10.89 | 18 58 34.92 |
| 6 | 19 8 33.56 | 34.66 | 22 31 18.9 | 17.2 | 10.957 | 17.94 | 6 2.20 | 18.36 | 10.83 | 19 2 31.47 |
| 7 | 19 12 56.26 | 57.44 | 22 23 55.1 | 53.1 | 10.936 | 19.04 | 6 28.35 | 18.34 | 10.77 | 19 6 28.03 |
| 8 | 19 17 18.46 | 19.72 | 22 16 5.0 | 2.7 | 10.914 | 20.14 | 6 54.01 | 18.31 | 10.70 | 19 10 24.59 |
| 9 | 19 21 40.11 | 41.44 | 22 7 48.7 | 46.2 | 10.892 | 21.22 | 7 19.11 | 18.28 | 10.63 | 19 14 21.15 |
| 10 | 19 26 1.22 | 2.61 | 21 59 6.5 | 3.7 | 10.868 | 22.29 | 7 43.67 | 18.24 | 10.55 | 19 18 17.71 |
| 11 | 19 30 21.75 | 23.21 | 21 49 58.6 | 55.5 | 10.844 | 23.35 | 8 7.62 | 18.19 | 10.47 | 19 22 14.27 |
| 12 | 19 34 41.69 | 43.22 | 21 40 25.3 | 21.9 | 10.818 | 24 41 | 8 31.00 | 18.14 | 10.39 | 19 26 10.82 |
| 13 | 19 39 1.02 | 2.61 | 21 30 26.8 | 23.1 | 10.792 | 25.45 | 8 53.78 | 18.08 | 10.30 | 19 30 7.38 |
| 14 | 19 43 19.72 | 21.38 | 21 19 63.4 | 59.3 | 10.765 | 26.48 | 9 15.92 | 18.01 | 10.21 | 19 34 3.94 |
| 15 | 19 47 37.78 | 39.50 | 21 9 15.4 | 11.0 | 10.738 | 27.50 | 9 37.43 | 17.94 | 10.12 | 19 38 0.50 |
| 16 | 19 51 55.18 | 56.96 | 20 57 63.2 | 58.4 | 10.710 | 28.51 | 9 58.28 | 17.86 | 10.03 | 19 41 57.06 |
| 17 | 19 56 11.91 | 13.75 | 20 46 26.8 | 21.7 | 10.682 | 29.50 | 10 18.45 | 17.78 | 9.93 | 19 45 53.61 |
| 18 | 20 0 27.95 | 29.84 | 20 34 26.8 | 21.4 | 10.653 | 30.49 | 10 37.93 | 17.69 | 9.83 | 19 49 50.17 |
| 19 | 20 4 43.28 | 45.22 | 20 21 63.3 | 57.6 | 10.624 | 31.46 | 10 56.69 | 17.60 | 9.73 | 19 53 46.73 |
| 20 | 20 8 57.89 | 59.88 | 20 9 16.8 | 10.7 | 10.593 | 32.41 | 11 14.74 | 17.50 | 9.63 | 19 57 43.29 |
| 21 | 20 13 11.77 | 13.80 | 19 56 7.5 | 1.1 | 10.562 | 33.35 | 11 32.06 | 17.40 | 9.52 | 20 1 39.85 |
| 22 | 20 17 24.90 | 26.97 | 19 42 35.9 | 29.1 | 10.531 | 34.28 | 11 48.63 | 17.29 | 9.41 | 20 5 36.40 |
| 23 | 20 21 37.27 | 39.38 | 19 28 42.2 | 35.1 | 10.499 | 35.19 | 12 4.43 | 17.18 | 9.30 | 20 9 32.96 |
| 24 | 20 25 48.86 | 51.01 | 19 14 27.0 | 19.6 | 10.466 | 36.09 | 12 19.47 | 17.07 | 9.19 | 20 13 29.52 |
| 25 | 20 29 59.66 | 61.85 | 18 59 50.3 | 42.6 | 10.433 | 36.96 | 12 33.71 | 16.96 | 9.08 | 20 17 26.08 |
| 26 | 20 34 9.67 | 11.89 | 18 44 52.7 | 44.7 | 10.400 | 37.82 | 12 47.16 | 16.83 | 8.97 | 20 21 22.63 |
| 27 | 20 38 18.86 | 21.11 | 18 29 34.8 | 26.5 | 10.366 | 38.67 | 12 59.78 | 16.70 | 8.86 | 20 25 19.19 |
| 28 | 20 42 27.23 | 29.50 | 18 13 56.8 | 47.9 | 10.332 | 39.49 | 13 11.58 | 16.58 | 8.75 | 20 29 15.74 |
| 29 | 20 46 34.77 | 37.06 | 17 57 59.2 | 50.2 | 10.297 | 40.30 | 13 22.57 | 16.45 | 8.63 | 20 33 12.30 |
| 30 | 20 50 41.48 | 43.79 | 17 41 42.4 | 33.1 | 10.262 | 41.08 | 13 32.71 | 16.32 | 8.52 | 20 37 8.86 |
| 31 | 20 54 47.35 | 49.68 | 17 24 66.7 | 57.2 | 10.227 | 41.86 | 13 42.02 | 16.18 | 8.40 | 20 41 5.42 |
| Feb. 1 | 20 58 52.38 | 54.73 | 17 8 12.7 | 3.0 | 10.192 | 42.62 | 13 50.49 | 16.04 | 8.29 | 20 45 1.97 |
| 2 | 21 2 56.57 | 58.93 | 16 50 60.7 | 50.7 | 10.157 | 43.37 | 13 58.11 | 15.89 | 8.17 | 20 48 58.53 |
| 3 | 21 6 59.91 | 62.28 | 16 33 31.0 | 20.8 | 10.122 | 44.09 | 14 4.88 | 15.74 | 8.06 | 20 52 55.09 |
| 4 | 21 11 2.41 | 4.79 | 16 15 44.2 | 33.7 | 10.087 | 44.80 | 14 10.82 | 15.59 | 7.94 | 20 56 51.65 |
| 5 | 21 15 4.08 | 6.47 | 15 57 40.8 | 30.1 | 10.053 | 45.49 | 14 15.93 | 15.43 | 7.83 | 21 0 48.20 |
| 6 | 21 19 4.93 | 7.32 | 15 39 21.0 | 10.1 | 10.018 | 46.16 | 14 20.21 | 15.26 | 7.71 | 21 4 44.76 |
| 7 | 21 23 4.96 | 7.36 | 15 20 45.4 | 34.2 | 9.984 | 46.81 | 14 23.69 | 15.09 | 7.60 | 21 8 41.31 |
| 8 | 21 27 4.18 | 6.58 | 15 1 54.1 | 42.7 | 9.951 | 47.45 | 14 26.35 | 14.92 | 7.48 | 21 12 37.87 |
| 9 | 21 31 2.60 | 5.00 | 14 42 47.8 | 36.3 | 9.918 | 48.07 | 14 28.20 | 14.75 | 7.37 | 21 16 34.42 |
| 10 | 21 35 0.22 | 2.61 | 14 23 26.7 | 15.0 | 9.885 | 48.67 | 14 29.26 | 14.57 | 7.26 | 21 20 30.98 |
| 11 | 21 38 57.07 | 59.45 | 14 3 51.4 | 39.5 | 9.853 | 49.26 | 14 29.54 | 14.38 | 7.15 | 21 24 27.53 |
| 12 | 21 42 53.16 | 55.54 | 13 43 62.0 | 49.9 | 9.821 | 49.84 | 14 29.07 | 14.19 | 7.04 | 21 28 24.09 |
| 13 | 21 46 48.50 | 50.87 | 13 23 59.2 | 47.0 | 9.791 | 50.40 | 14 27.85 | 13.99 | 6.93 | 21 32 20.64 |
| 14 | 21 50 43.10 | 45.45 | 13 3 43.1 | 30.9 | 9.761 | 50.93 | 14 25.88 | 13.79 | 6.83 | 21 36 17.20 |
| 15 | 21 54 36.98 | 39.32 | 12 43 14.3 | 2.0 | 9.731 | 51.46 | 14 23.20 | 13.57 | 6.72 | 21 40 13.76 |
| 16 | 21 58 30.15 | 32.47 | 12 22 33.1 | 20.7 | 9.702 | 51.96 | 14 19.81 | 13.36 | 6.62 | 21 44 10.32 |
| 17 | 22 2 22.62 | 24.92 | 12 1 40.0 | 27.6 | 9.673 | 52.45 | 14 15.72 | 13.15 | 6.51 | 21 48 6 87 |
| 18 | 22 6 14.40 | 16.69 | 11 40 35.3 | 22.8 | 9.644 | 52.93 | 14 10.94 | 12.93 | 6.41 | 21 52 3.43 |
| 19 | 22 10 5.50 | 7.77 | 11 19 19.5 | 7.0 | 9·616 | 53.38 | 14 5.47 | 12.71 | 6.31 | 21 55 59.98 |
| 20 | 22 13 55.94 | 58.18 | 10 57 52 8 | 40.2 | 9.588 | 53.82 | 13 59.35 | 12.48 | 6.21 | 21 59 56.54 |
| 21 | 22 17 45.74 | 47.96 | 10 36 15.9 | 3.4 | 9.561 | 54.24 | 13 52.57 | 12.26 | 6 11 | 22 3 53.09 |
| 22 | 22 21 34.90 | 37.09 | 10 14 29.1 | 16.6 | 9.535 | 54.64 | 13 45.18 | 12.03 | 6.02 | 22 7 49.65 |
| 23 | 22 25 23.44 | 25.60 | 9 52 32.8 | 20.3 | 9.510 | 55.03 | 13 37.17 | 11.80 | 5.93 | 22 11 46.20 |
| 24 | 22 29 11.36 | 13.49 | 9 30 27.5 | 15.1 | 9.485 | 55.39 | 13 28.53 | 11.57 | 5.84 | 22 15 42.75 |
| 25 | 22 32 58.68 | 60.78 | 9 8 13.7 | 1.4 | 9.460 | 55.74 | 13 19.29 | 11.34 | 5.76 | 22 19 39.30 |
| 26 | 22 36 45.41 | 47.47 | 8 45 51.6 | 39.3 | 9.436 | 56.08 | 13 9.47 | 11.11 | 5.67 | 22 23 35.86 |
| 27 | 22 40 31.57 | 33.60 | 8 23 21.8 | 9.6 | 9.412 | 56.39 | 12 59.07 | 10.88 | 5.59 | 22 27 32.41 |
| 28 | 22 44 17.18 | 19.18 | 8 0 44.8 | 32.7 | 9.389 | 56.68 | 12 48.12 | 10.64 | 5.51 | 22 31 28.97 |
| 29 | 22 48 2.25 | 4.22 | − 7 37 60.9 | 49.0 | 9.366 | +56.97 | +12 36.63 | 16 10.40 | 1 5.44 | 22 35 25.52 |

Note.—For *Mean* interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.

## AT WASHINGTON MEAN AND APPARENT NOON.

| Date. 1876. | APPARENT RIGHT ASCENSION. Mean Noon. | APPARENT RIGHT ASCENSION. Apparent Noon. | APPARENT DECLINATION. Mean Noon. | APPARENT DECLINATION. Apparent Noon. | Hourly Motion, Mean Noon. Right Ascension. | Hourly Motion, Mean Noon. Declination. | Equation of Time for Apparent Noon, | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. passing Merid. | Sidereal Time of Mean Noon. |
|---|---|---|---|---|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | s | ″ | m s | ′ ″ | m s | h m s |
| Mar. 1 | 22 51 46.78 | 48.71 | — 7 14 70.5 | 58.7 | 9.345 | +57.22 | +12 24.50 | 16 10.16 | 1 5.37 | 22 39 22.08 |
| 2 | 22 55 30.79 | 32.68 | 6 52 14.1 | 2.3 | 9.324 | 57.47 | 12 12.06 | 9.92 | 5.30 | 22 43 18.63 |
| 3 | 22 59 14.31 | 16.17 | 6 29 12.0 | 0.4 | 9.304 | 57.69 | 11 59.02 | 9.68 | 5.23 | 22 47 15.19 |
| 4 | 23 2 57.37 | 59.19 | 6 5 64.5 | 53.1 | 9.285 | 57.90 | 11 45.52 | 9.44 | 5.16 | 22 51 11.74 |
| 5 | 23 6 39.97 | 41.75 | 5 42 52.5 | 41.3 | 9.266 | 58.10 | 11 31.55 | 9.19 | 5.10 | 22 55 8.30 |
| 6 | 23 10 22.14 | 23.88 | 5 19 35.9 | 24.9 | 9.248 | 58.28 | 11 17.17 | 8.94 | 5.04 | 22 59 4.85 |
| 7 | 23 14 3.90 | 5.60 | 4 56 15.1 | 4.3 | 9.232 | 58.44 | 11 2.39 | 8.68 | 4.99 | 23 3 1.41 |
| 8 | 23 17 45.27 | 46.95 | 4 32 50.6 | 40.0 | 9.216 | 58.59 | 10 47.21 | 8.42 | 4.93 | 23 6 57.96 |
| 9 | 23 21 26.27 | 27.89 | 4 9 22.7 | 12.4 | 9.201 | 58.73 | 10 31.65 | 8.16 | 4.88 | 23 10 54.52 |
| 10 | 23 25 6.94 | 8.51 | 3 45 51.8 | 41.8 | 9.187 | 58.84 | 10 15.77 | 7.90 | 4.83 | 23 14 51.07 |
| 11 | 23 28 47.28 | 48.81 | 3 22 18.0 | 8.3 | 9.174 | 58.95 | 9 59.56 | 7.64 | 4.79 | 23 18 47.62 |
| 12 | 23 32 27.33 | 28.81 | 2 58 42.0 | 32.5 | 9.163 | 59.04 | 9 43.06 | 7.37 | 4.74 | 23 22 44.17 |
| 13 | 23 36 7.11 | 8.55 | 2 34 63.9 | 54.6 | 9.152 | 59.11 | 9 26.27 | 7.10 | 4.70 | 23 26 40.73 |
| 14 | 23 39 46.64 | 48.03 | 2 11 24.2 | 15.1 | 9.142 | 59.18 | 9 9.25 | 6.83 | 4.66 | 23 30 37.28 |
| 15 | 23 43 25.95 | 27.30 | 1 47 43.1 | 34.3 | 9.133 | 59.23 | 8 52.01 | 6.55 | 4.63 | 23 34 33.84 |
| 16 | 23 47 5.06 | 6.36 | 1 23 61.0 | 52.5 | 9.126 | 59.26 | 8 34.58 | 6.28 | 4.60 | 23 38 30.39 |
| 17 | 23 50 43.99 | 45.25 | 1 0 18.3 | 9.8 | 9.119 | 59.28 | 8 16.96 | 6.00 | 4.58 | 23 42 26.94 |
| 18 | 23 54 22.76 | 23.98 | 0 36 35.4 | 27.6 | 9.113 | 59.29 | 7 59.18 | 5.72 | 4.56 | 23 46 23.49 |
| 19 | 23 58 1.38 | 2.55 | — 0 12 52.4 | 44.9 | 9.107 | 59.28 | 7 41.24 | 5.44 | 4.54 | 23 50 20.05 |
| 20 | 0 1 39.89 | 41.01 | + 0 10 49.8 | 57.1 | 9.102 | 59.24 | 7 23.28 | 5.16 | 4.52 | 23 54 16.60 |
| 21 | 0 5 18.30 | 19.37 | 0 34 31.3 | 38.3 | 9.098 | 59.20 | 7 5.06 | 4.88 | 4.50 | 23 58 13.16 |
| 22 | 0 8 56.62 | 57.65 | 0 58 11.5 | 18.2 | 9.096 | 59.15 | 6 46.83 | 4.60 | 4.49 | 0 2 9.71 |
| 23 | 0 12 34.88 | 35.86 | 1 21 50.2 | 56.6 | 9.093 | 59.07 | 6 28.54 | 4.32 | 4.48 | 0 6 6.27 |
| 24 | 0 16 13.09 | 14.03 | 1 45 26.9 | 32.9 | 9.091 | 58.98 | 6 10.20 | 4.04 | 4.47 | 0 10 2.82 |
| 25 | 0 19 51.27 | 52.16 | 2 9 1.2 | 6.9 | 9.090 | 58.86 | 5 51.83 | 3.76 | 4.46 | 0 13 59.37 |
| 26 | 0 23 29.44 | 30.28 | 2 32 32.7 | 38.1 | 9.090 | 58.74 | 5 33.46 | 3.48 | 4.46 | 0 17 55.92 |
| 27 | 0 27 7.61 | 8.41 | 2 56 1.0 | 6.1 | 9.090 | 58.61 | 5 15.08 | 3.21 | 4.46 | 0 21 52.48 |
| 28 | 0 30 45.79 | 46.54 | 3 19 25.7 | 30.5 | 9.091 | 58.45 | 4 56.72 | 2.93 | 4.46 | 0 25 49.03 |
| 29 | 0 34 24.01 | 24.71 | 3 42 46.6 | 51.1 | 9.093 | 58.28 | 4 38.38 | 2.66 | 4.47 | 0 29 45.59 |
| 30 | 0 38 2.29 | 2.94 | 4 6 3.2 | 7.4 | 9.096 | 58.10 | 4 20.10 | 2.38 | 4.48 | 0 33 42.14 |
| 31 | 0 41 40.63 | 41.24 | 4 29 15.1 | 19.0 | 9.099 | 57.90 | 4 1.89 | 2.11 | 4.49 | 0 37 38.69 |
| Apr. 1 | 0 45 19.06 | 19.62 | 4 52 22.1 | 25.6 | 9.103 | 57.68 | 3 43.78 | 1.84 | 4.51 | 0 41 35.24 |
| 2 | 0 48 57.60 | 58.11 | 5 15 23.7 | 27.0 | 9.108 | 57.45 | 3 25.77 | 1.57 | 4.53 | 0 45 31.80 |
| 3 | 0 52 36.26 | 36.73 | 5 38 19.6 | 22.4 | 9.114 | 57.20 | 3 7.89 | 1.30 | 4.56 | 0 49 28.35 |
| 4 | 0 56 15.07 | 15.49 | 6 1 9.4 | 12.1 | 9.120 | 56.94 | 2 50.14 | 1.03 | 4.59 | 0 53 24.91 |
| 5 | 0 59 54.05 | 54.43 | 6 23 53.0 | 55.5 | 9.128 | 56.67 | 2 32.56 | 0.76 | 4.62 | 0 57 21.46 |
| 6 | 1 3 33.22 | 33.56 | 6 46 29.9 | 32.1 | 9.136 | 56.39 | 2 15.17 | 0.49 | 4.65 | 1 1 18.02 |
| 7 | 1 7 12.60 | 12.90 | 7 8 59.8 | 61.7 | 9.145 | 56.09 | 1 58.00 | 16 0.22 | 4.68 | 1 5 14.57 |
| 8 | 1 10 52.20 | 52.46 | 7 31 22.4 | 24.0 | 9.154 | 55.78 | 1 41.06 | 15 59.95 | 4.72 | 1 9 11.13 |
| 9 | 1 14 32.04 | 32.26 | 7 53 37.4 | 38.7 | 9.166 | 55.46 | 1 24.36 | 59.68 | 4.76 | 1 13 7.68 |
| 10 | 1 18 12.16 | 12.34 | 8 15 44.5 | 45.6 | 9.178 | 55.13 | 1 7.92 | 59.40 | 4.80 | 1 17 4.24 |
| 11 | 1 21 52.58 | 52.71 | 8 37 43.3 | 44.2 | 9.191 | 54.78 | 0 51.79 | 59.12 | 4.84 | 1 21 0.79 |
| 12 | 1 25 33.31 | 33.40 | 8 59 33.7 | 34.3 | 9.204 | 54.42 | 0 35.98 | 58.85 | 4.89 | 1 24 57.34 |
| 13 | 1 29 14.37 | 14.42 | 9 21 15.2 | 15.5 | 9.218 | 54.05 | 0 20.49 | 58.58 | 4.93 | 1 28 53.89 |
| 14 | 1 32 55.78 | 55.80 | 9 42 47.6 | 47.7 | 9.233 | 53.66 | + 0 5.35 | 58.31 | 4.98 | 1 32 50.45 |
| 15 | 1 36 37.55 | 37.53 | 10 4 10.5 | 10.4 | 9.248 | 53.25 | — 0 9.44 | 58.04 | 5.03 | 1 36 47.00 |
| 16 | 1 40 19.71 | 19.65 | 10 25 23.5 | 23.2 | 9.264 | 52.84 | 0 23.85 | 57.77 | 5.09 | 1 40 43.56 |
| 17 | 1 44 2.27 | 2.17 | 10 46 26.3 | 25.8 | 9.281 | 52.41 | 0 37.85 | 57.50 | 5.14 | 1 44 40.11 |
| 18 | 1 47 45.24 | 45.10 | 11 7 18.7 | 18.0 | 9.298 | 51.96 | 0 51.42 | 57.23 | 5.20 | 1 48 36.67 |
| 19 | 1 51 28.63 | 28.46 | 11 27 60.2 | 59.3 | 9.316 | 51.50 | 1 4.59 | 56.96 | 5.26 | 1 52 33.22 |
| 20 | 1 55 12.44 | 12.24 | 11 48 30.4 | 29.4 | 9.334 | 51.03 | 1 17.33 | 56.70 | 5.32 | 1 56 29.78 |
| 21 | 1 58 56.70 | 56.47 | 12 8 49.1 | 47.9 | 9.353 | 50.53 | 1 29.62 | 56.44 | 5.38 | 2 0 26.33 |
| 22 | 2 2 41.43 | 41.16 | 12 28 55.9 | 54.5 | 9.373 | 50.03 | 1 41.45 | 56.19 | 5.45 | 2 4 22.89 |
| 23 | 2 6 26.62 | 26.32 | 12 48 50.4 | 48.9 | 9.393 | 49.51 | 1 52.80 | 55.94 | 5.52 | 2 8 19.44 |
| 24 | 2 10 12.29 | 11.96 | 13 8 32.3 | 30.7 | 9.413 | 48.97 | 2 3.68 | 55.69 | 5.59 | 2 12 16.00 |
| 25 | 2 13 58.44 | 58.08 | 13 27 61.2 | 59.4 | 9.433 | 48.42 | 2 14.09 | 55.44 | 5.66 | 2 16 12.55 |
| 26 | 2 17 45.07 | 44.69 | 13 47 16.8 | 14.9 | 9.453 | 47.86 | 2 24.02 | 55.19 | 5.73 | 2 20 9.11 |
| 27 | 2 21 32.19 | 31.79 | 14 6 18.7 | 16.7 | 9.473 | 47.29 | 2 33.46 | 54.95 | 5.81 | 2 24 5.66 |
| 28 | 2 25 19.81 | 19.39 | 14 25 6.6 | 4.5 | 9.494 | 46.69 | 2 42.38 | 54.71 | 5.89 | 2 28 2.22 |
| 29 | 2 29 7.94 | 7.49 | 14 43 40.1 | 37.9 | 9.515 | 46.09 | 2 50.80 | 54.47 | 5.97 | 2 31 58.77 |
| 30 | 2 32 56.58 | 56.11 | +15 1 59.0 | 56.8 | 9.537 | +45.48 | — 2 58.72 | 15 54.24 | 1 6.05 | 2 35 55.33 |

**NOTE.—For *Mean* interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.**

## AT WASHINGTON MEAN AND APPARENT NOON.

| Date. | APPARENT RIGHT ASCENSION. | | APPARENT DECLINATION. | | Hourly Motion. Mean Noon. | | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. passing Merid. | Sidereal Time of Mean Noon. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | Mean Noon. | Appa-rent Noon. | Mean Noon. | Appa-rent Noon. | Right Ascen-sion. | Decli-nation. | | | | |
| | h m s | s | ° ′ ″ | ″ | s | ″ | m s | ′ ″ | m s | h m s |
| May 1 | 2 36 45.74 | 45.25 | +15 20 2.9 | 0.5 | 9.559 | +44.85 | − 3 6.11 | 15 54.01 | 1 6.13 | 2 39 51.89 |
| 2 | 2 40 35.43 | 34.92 | 15 37 51.6 | 49.2 | 9.581 | 44.20 | 3 12.99 | 53.78 | 6.21 | 2 43 48.45 |
| 3 | 2 44 25.65 | 25.12 | 15 55 24.8 | 22.4 | 9.603 | 43.55 | 3 19.32 | 53.55 | 6.29 | 2 47 45.00 |
| 4 | 2 48 16.41 | 15.87 | 16 12 42.0 | 39.5 | 9.626 | 42.88 | 3 25.12 | 53.33 | 6.37 | 2 51 41.56 |
| 5 | 2 52 7.71 | 7.15 | 16 29 43.0 | 40.5 | 9.649 | 42.20 | 3 30.39 | 53.11 | 6.45 | 2 55 38.11 |
| 6 | 2 55 59.56 | 58.98 | 16 46 27.5 | 25.1 | 9.672 | 41.51 | 3 35.10 | 52.89 | 6.53 | 2 59 34.67 |
| 7 | 2 59 51.98 | 51.39 | 17 2 55.4 | 52.9 | 9.694 | 40.81 | 3 39.23 | 52.67 | 6.61 | 3 3 31.22 |
| 8 | 3 3 44.97 | 44.37 | 17 19 6.2 | 3.7 | 9 719 | 40.00 | 3 42.80 | 52.45 | 6.69 | 3 7 27.78 |
| 9 | 3 7 38.53 | 37.92 | 17 34 59.8 | 57.3 | 9.743 | 39.37 | 3 45.80 | 52.24 | 6.77 | 3 11 24.34 |
| 10 | 3 11 32.67 | 32.05 | 17 50 35.8 | 33.4 | 9.768 | 38.63 | 3 48.21 | 52.03 | 6.86 | 3 15 20.90 |
| 11 | 3 15 27.39 | 26.76 | 18 5 54.0 | 51.6 | 9.792 | 37.89 | 3 50.03 | 51.82 | 6.94 | 3 19 17.45 |
| 12 | 3 19 22.70 | 22.06 | 18 20 54.1 | 51.7 | 9.812 | 37.13 | 3 51.28 | 51.61 | 7.03 | 3 23 14.01 |
| 13 | 3 23 18.59 | 17.95 | 18 35 35.9 | 33.5 | 9.841 | 36.35 | 3 51.95 | 51.40 | 7.11 | 3 27 10.56 |
| 14 | 3 27 15.08 | 14.45 | 18 49 58.9 | 56.6 | 9.865 | 35.56 | 3 52.03 | 51.20 | 7.19 | 3 31 7.12 |
| 15 | 3 31 12.15 | 11.52 | 19 4 3.0 | 0.8 | 9.889 | 34 77 | 3 51.51 | 51.00 | 7.27 | 3 35 3.68 |
| 16 | 3 35 9.81 | 9.18 | 19 17 47.8 | 45.6 | 9.914 | 33.96 | 3 50.42 | 50.80 | 7.35 | 3 39 0.24 |
| 17 | 3 39 8.05 | 7.42 | 19 31 13.1 | 11.0 | 9.939 | 33.14 | 3 48.73 | 50.60 | 7.43 | 3 42 56.79 |
| 18 | 3 43 6 87 | 6.24 | 19 44 18.7 | 16.7 | 9.962 | 32.31 | 3 46.48 | 50.41 | 7.51 | 3 46 53 35 |
| 19 | 3 47 6.26 | 5.63 | 19 57 4.3 | 2.3 | 9.986 | 31.47 | 3 43.66 | 50.22 | 7.59 | 3 50 49.91 |
| 20 | 3 51 6.21 | 5.59 | 20 9 29.4 | 27.5 | 10.009 | 30.61 | 3 40.27 | 50.03 | 7.66 | 3 54 46.47 |
| 21 | 3 55 6.70 | 6.09 | 20 21 33.9 | 32.0 | 10.031 | 29.74 | 3 36.32 | 49.85 | 7.74 | 3 58 43.02 |
| 22 | 3 59 7.73 | 7.13 | 20 33 17.4 | 15.6 | 10.052 | 28.87 | 3 31.85 | 49.68 | 7.81 | 4 2 39.58 |
| 23 | 4 3 9.28 | 8.70 | 20 44 39.8 | 38.2 | 10.073 | 27.99 | 3 26.87 | 49.51 | 7.88 | 4 6 36.14 |
| 24 | 4 7 11.35 | 10.78 | 20 55 40.9 | 39.4 | 10.094 | 27.10 | 3 21.37 | 49.35 | 7.95 | 4 10 32.70 |
| 25 | 4 11 13.91 | 13 36 | 21 6 20.4 | 18.9 | 10.114 | 26.19 | 3 15.37 | 49.19 | 8.02 | 4 14 29.26 |
| 26 | 4 15 16.95 | 16.41 | 21 16 38.0 | 36.6 | 10.134 | 25.27 | 3 8.88 | 49.04 | 8.09 | 4 18 25.82 |
| 27 | 4 19 20.46 | 19.93 | 21 26 33.5 | 32.3 | 10.154 | 24.34 | 3 1.92 | 48.89 | 8.16 | 4 22 22.37 |
| 28 | 4 23 24.42 | 23.91 | 21 36 6.6 | 5.4 | 10.173 | 23.41 | 2 54.52 | 48.74 | 8.22 | 4 26 18.93 |
| 29 | 4 27 28.81 | 28.33 | 21 45 17.2 | 16.2 | 10.191 | 22.47 | 2 46.72 | 48.60 | 8.28 | 4 30 15.49 |
| 30 | 4 31 33.62 | 33.16 | 21 54 5.2 | 4.2 | 10.209 | 21.52 | 2 38.45 | 48.46 | 8.34 | 4 34 12.05 |
| 31 | 4 35 38.82 | 38.39 | 22 2 30.3 | 29.4 | 10.225 | 20.56 | 2 29.80 | 48.33 | 8.40 | 4 38 8.61 |
| June 1 | 4 39 44.42 | 44.01 | 22 10 32.4 | 31.6 | 10.241 | 19.60 | 2 20.77 | 48.20 | 8.46 | 4 42 5.17 |
| 2 | 4 43 50.38 | 49.99 | 22 18 11.3 | 10.6 | 10.256 | 18.63 | 2 11.35 | 48.07 | 8.51 | 4 46 1.72 |
| 3 | 4 47 56.70 | 56.34 | 22 25 26.9 | 26.3 | 10.271 | 17.66 | 2 1.58 | 47.95 | 8.56 | 4 49 58.28 |
| 4 | 4 52 3.36 | 3.04 | 22 32 19.0 | 18.4 | 10.285 | 16.68 | 1 51.49 | 47.84 | 8.61 | 4 53 54.84 |
| 5 | 4 56 10.34 | 10.05 | 22 38 47.4 | 46.9 | 10.298 | 15.69 | 1 41.07 | 47.73 | 8.66 | 4 57 51.40 |
| 6 | 5 0 17.63 | 17.37 | 22 44 52.1 | 51.8 | 10.310 | 14.70 | 1 30.34 | 47.61 | 8.70 | 5 1 47.96 |
| 7 | 5 4 25.21 | 24.98 | 22 50 32.9 | 32.6 | 10.321 | 13.70 | 1 19.32 | 47.50 | 8.74 | 5 5 44.52 |
| 8 | 5 8 33.07 | 32.87 | 22 55 49.7 | 49.4 | 10.332 | 12.70 | 1 8.01 | 47.39 | 8.77 | 5 9 41.07 |
| 9 | 5 12 41.20 | 41.03 | 23 0 42.4 | 42.2 | 10.343 | 11.70 | 0 56.44 | 47.29 | 8.81 | 5 13 37.63 |
| 10 | 5 16 49.57 | 49.43 | 23 5 11.0 | 10.8 | 10.353 | 10.69 | 0 44.62 | 47.19 | 8.84 | 5 17 34.19 |
| 11 | 5 20 58.17 | 58.07 | 23 9 15.3 | 15.2 | 10.362 | 9.68 | 0 32.57 | 47.09 | 8.87 | 5 21 30.75 |
| 12 | 5 25 6.98 | 6.92 | 23 12 55.2 | 55.2 | 10.370 | 8.66 | 0 20.32 | 46.99 | 8.89 | 5 25 27.31 |
| 13 | 5 29 15.97 | 15.95 | 23 16 10.5 | 10.5 | 10.377 | 7.63 | − 0 7.89 | 46.90 | 8.91 | 5 29 23.87 |
| 14 | 5 33 25.13 | 25.14 | 23 19 1.2 | 1.2 | 10.383 | 6.60 | + 0 4.70 | 46.81 | 8.93 | 5 33 20.43 |
| 15 | 5 37 34.44 | 34.49 | 23 21 27.3 | 27.3 | 10.389 | 5.57 | 0 17.45 | 46.73 | 8.94 | 5 37 16.99 |
| 16 | 5 41 43.87 | 43.96 | 23 23 28.7 | 28.7 | 10.393 | 4.54 | 0 30.33 | 46.66 | 8.96 | 5 41 13.54 |
| 17 | 5 45 53.39 | 53.51 | 23 25 5.3 | 5.3 | 10.397 | 3.51 | 0 43.29 | 46.59 | 8.97 | 5 45 10.10 |
| 18 | 5 50 2.97 | 3.13 | 23 26 17.2 | 17.2 | 10.399 | 2.48 | 0 56 32 | 46.52 | 8.97 | 5 49 6.66 |
| 19 | 5 54 12.60 | 12.79 | 23 27 4.3 | 4.3 | 10.401 | 1.45 | 1 9.39 | 46.46 | 8.97 | 5 53 3.22 |
| 20 | 5 58 22.25 | 22.48 | 23 27 26.6 | 26.6 | 10.401 | + 0.41 | 1 22.48 | 46.40 | 8.97 | 5 56 59.78 |
| 21 | 6 2 31.88 | 32.15 | 23 27 23.9 | 23.9 | 10.400 | - 0.63 | 1 35.56 | 46.34 | 8.97 | 6 0 56.34 |
| 22 | 6 6 41.48 | 41.78 | 23 26 56.2 | 56.2 | 10.398 | 1.67 | 1 48.61 | 46.30 | 8.96 | 6 4 52.90 |
| 23 | 6 10 51.00 | 51.34 | 23 26 3.8 | 3.8 | 10.394 | 2.70 | 2 1.57 | 46.26 | 8.95 | 6 8 49.46 |
| 24 | 6 15 0.43 | 0.81 | 23 24 46.6 | 46.6 | 10.390 | 3.73 | 2 14.43 | 46.22 | 8.94 | 6 12 46.01 |
| 25 | 6 19 9.73 | 10.15 | 23 23 4.8 | 4.7 | 10.385 | 4.75 | 2 27.18 | 46.20 | 8.93 | 6 16 42.57 |
| 26 | 6 23 18.89 | 19.34 | 23 20 58.3 | 58.1 | 10.378 | 5.77 | 2 39.80 | 46.18 | 8.91 | 6 20 39.13 |
| 27 | 6 27 27.87 | 28.36 | 23 18 27.1 | 26.8 | 10.370 | 6.80 | 2 52.22 | 46.16 | 8.88 | 6 24 35.69 |
| 28 | 6 31 36.65 | 37.18 | 23 15 31.4 | 31.0 | 10.361 | 7.82 | 3 4.43 | 46.14 | 8.85 | 6 28 32.25 |
| 29 | 6 35 45.20 | 45.76 | 23 12 11.2 | 10.7 | 10.351 | 8.84 | 3 16.42 | 46.13 | 8.82 | 6 32 28.81 |
| 30 | 6 39 53.50 | 54.09 | 23 8 26.7 | 26.2 | 10.340 | 9.85 | 3 28.16 | 46.12 | 8.79 | 6 36 25.37 |
| 31 | 6 44 1.54 | 2.16 | +23 4 17.9 | 17.3 | 10.328 | -10.86 | + 3 39.63 | 15 46.12 | 1 8.75 | 6 40 21.93 |

**Note.**—For *Mean* interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.

## AT WASHINGTON MEAN AND APPARENT NOON.

| Date. 1876. | APPARENT RIGHT ASCENSION. |  | APPARENT DECLINATION. |  | Hourly Motion, Mean Noon. |  | Equation of Time for Apparent Noon, | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. passing Merid. | Sidereal Time of Mean Noon. |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Mean Noon. | Apparent Noon. | Mean Noon. | Apparent Noon. | Right Ascension. | Declination. |  |  |  |  |
|  | h m s | s | ° ′ ″ | ″ | s | ″ | m s | ′ ″ | m s | h m s |
| July 1 | 6 44 1.54 | 2.16 | +23 4 17.9 | 17.3 | 10.328 | -10.86 | + 3 39.63 | 15 46.12 | 1 8.75 | 6 40 21.93 |
| 2 | 6 48 9.29 | 9.95 | 22 59 45.0 | 44.3 | 10.316 | 11.87 | 3 50.83 | 46.13 | 8.72 | 6 44 18.49 |
| 3 | 6 52 16.74 | 17.43 | 22 54 48.1 | 47.3 | 10.303 | 12.87 | 4 1 73 | 46.14 | 8.68 | 6 48 15.05 |
| 4 | 6 56 23.87 | 24.59 | 22 49 27.3 | 26.3 | 10.289 | 13.86 | 4 12.31 | 46.15 | 8.63 | 6 52 11.60 |
| 5 | 7 0 30.66 | 31.41 | 22 43 42.7 | 41.6 | 10.276 | 14.85 | 4 22.54 | 46.16 | 8.58 | 6 56 8.16 |
| 6 | 7 4 37.09 | 37.87 | 22 37 34.5 | 33.3 | 10.261 | 15.83 | 4 32.41 | 46.18 | 8.53 | 7 0 4.72 |
| 7 | 7 8 43.16 | 43.96 | 22 31 2.9 | 1.6 | 10.246 | 16.81 | 4 41.91 | 46.20 | 8.48 | 7 4 1.28 |
| 8 | 7 12 48.85 | 49.67 | 22 24 8.0 | 6.6 | 10.229 | 17.78 | 4 51.04 | 46.23 | 8.43 | 7 7 57.84 |
| 9 | 7 16 54.15 | 54.99 | 22 16 49.8 | 48.3 | 10.212 | 18.74 | 4 59.77 | 46.26 | 8.37 | 7 11 54.40 |
| 10 | 7 20 59.03 | 59.89 | 22 9 8.7 | 7.1 | 10.195 | 19.69 | 5 8.11 | 46.29 | 8.31 | 7 15 50.95 |
| 11 | 7 25 3.49 | 4.38 | 22 1 4.6 | 2.8 | 10.177 | 20.64 | 5 16.02 | 46.32 | 8.25 | 7 19 47.51 |
| 12 | 7 29 7.51 | 8.42 | 21 52 37.9 | 36.0 | 10.158 | 21.58 | 5 23.48 | 46.36 | 8.19 | 7 23 44.07 |
| 13 | 7 33 11.08 | 12.00 | 21 43 48.6 | 46.6 | 10.139 | 22.52 | 5 30.49 | 46.40 | 8.12 | 7 27 40.63 |
| 14 | 7 37 14.19 | 15.13 | 21 34 37.1 | 35.0 | 10.119 | 23.45 | 5 37.04 | 46.44 | 8.05 | 7 31 37.19 |
| 15 | 7 41 16.83 | 17.79 | 21 25 3.5 | 1.3 | 10.099 | 24.36 | 5 43.12 | 46.49 | 7.98 | 7 35 33.75 |
| 16 | 7 45 18.98 | 19.95 | 21 15 7.9 | 5.5 | 10.078 | 25.27 | 5 48.70 | 46.55 | 7.91 | 7 39 30.30 |
| 17 | 7 49 20.62 | 21.61 | 21 4 50.5 | 47.9 | 10.056 | 26.17 | 5 53.77 | 46.61 | 7.83 | 7 43 26.86 |
| 18 | 7 53 21.74 | 22.74 | 20 54 11.7 | 9.1 | 10.034 | 27.06 | 5 58.32 | 46.67 | 7.75 | 7 47 23.42 |
| 19 | 7 57 22.32 | 23.32 | 20 43 11.6 | 8.9 | 10.012 | 27.94 | 6 2.35 | 46.75 | 7.67 | 7 51 19.98 |
| 20 | 8 1 22.36 | 23.36 | 20 31 50.5 | 47.6 | 9.989 | 28.81 | 6 5.84 | 46.83 | 7.59 | 7 55 16.53 |
| 21 | 8 5 21.84 | 22.85 | 20 20 8.7 | 5.7 | 9.966 | 29.67 | 6 8.77 | 46.91 | 7.51 | 7 59 13.09 |
| 22 | 8 9 20.75 | 21.77 | 20 8 6.4 | 3.3 | 9.942 | 30.52 | 6 11.11 | 47.00 | 7.43 | 8 3 9.65 |
| 23 | 8 13 19.09 | 20.12 | 19 55 43.9 | 40.7 | 9.918 | 31.36 | 6 12.89 | 47.09 | 7.34 | 8 7 6.21 |
| 24 | 8 17 16.83 | 17.86 | 19 42 61.4 | 58.1 | 9.894 | 32.18 | 6 14.08 | 47.19 | 7.26 | 8 11 2.76 |
| 25 | 8 21 13.97 | 14.99 | 19 29 59.3 | 55.9 | 9.869 | 32.99 | 6 14.67 | 47.29 | 7.17 | 8 14 59.32 |
| 26 | 8 25 10.50 | 11.52 | 19 16 37.8 | 34.3 | 9.843 | 33.80 | 6 14.63 | 47.40 | 7.09 | 8 18 55.88 |
| 27 | 8 29 6.41 | 7.42 | 19 2 57.3 | 53.7 | 9.817 | 34.59 | 6 13.98 | 47.52 | 7.00 | 8 22 52.44 |
| 28 | 8 33 1.71 | 2.72 | 18 48 57.9 | 54.3 | 9.791 | 35.37 | 6 12.72 | 47.64 | 6.92 | 8 26 48.99 |
| 29 | 8 36 56.38 | 57.39 | 18 34 40.1 | 36.4 | 9.765 | 36.12 | 6 10.82 | 47.76 | 6.83 | 8 30 45.55 |
| 30 | 8 40 50.44 | 51.44 | 18 20 3.9 | 0.3 | 9.739 | 36.88 | 6 8.31 | 47.88 | 6.75 | 8 34 42.11 |
| 31 | 8 44 43.87 | 44.85 | 18 5 10.0 | 6.2 | 9.713 | 37.62 | 6 5.19 | 48.01 | 6.66 | 8 38 38.67 |
| Aug. 1 | 8 48 36.69 | 37.66 | 17 49 58.3 | 54.4 | 9.688 | 38.34 | 6 1.45 | 48.14 | 6.58 | 8 42 35.22 |
| 2 | 8 52 28.88 | 29.84 | 17 34 29.4 | 25.5 | 9.663 | 39.06 | 5 57.09 | 48.28 | 6.49 | 8 46 31.78 |
| 3 | 8 56 20.46 | 21.41 | 17 18 43.4 | 39.5 | 9.637 | 39.77 | 5 52.11 | 48.42 | 6.41 | 8 50 28.33 |
| 4 | 9 0 11.44 | 12.37 | 17 2 40.5 | 36.6 | 9.612 | 40.47 | 5 46.54 | 48.56 | 6.32 | 8 54 24.89 |
| 5 | 9 4 1.82 | 2.73 | 16 46 21.1 | 17.2 | 9.587 | 41.15 | 5 40.37 | 48.70 | 6.24 | 8 58 21.45 |
| 6 | 9 7 51.62 | 52.51 | 16 29 45.4 | 41.5 | 9.563 | 41.82 | 5 33.60 | 48.85 | 6.15 | 9 2 18.01 |
| 7 | 9 11 40.85 | 41.72 | 16 12 53.7 | 49.8 | 9.539 | 42.47 | 5 26.27 | 49.00 | 6.07 | 9 6 14.56 |
| 8 | 9 15 29.49 | 30.34 | 15 55 46.4 | 42.6 | 9.515 | 43.12 | 5 18.35 | 49.15 | 5.98 | 9 10 11.12 |
| 9 | 9 19 17.55 | 18.37 | 15 38 23.6 | 19.8 | 9.491 | 43.76 | 5 9.84 | 49.30 | 5.90 | 9 14 7.67 |
| 10 | 9 23 5.04 | 5.83 | 15 20 45.7 | 41.9 | 9.468 | 44.39 | 5 0.78 | 49.46 | 5.81 | 9 18 4.23 |
| 11 | 9 26 51.99 | 52.75 | 15 2 53.0 | 49.3 | 9.445 | 45.01 | 4 51.19 | 49.62 | 5.73 | 9 22 0.78 |
| 12 | 9 30 38.41 | 39.14 | 14 44 45.7 | 42.1 | 9.423 | 45.60 | 4 41.04 | 49.79 | 5.64 | 9 25 57.34 |
| 13 | 9 34 24.31 | 25.02 | 14 26 24.2 | 20.7 | 9.402 | 46.19 | 4 30.40 | 49.96 | 5.56 | 9 29 53.89 |
| 14 | 9 38 9.68 | 10.36 | 14 7 48.7 | 45.4 | 9.381 | 46.78 | 4 19.22 | 50.13 | 5.48 | 9 33 50.45 |
| 15 | 9 41 54.54 | 55.19 | 13 48 59.7 | 56.5 | 9.360 | 47.32 | 4 7.51 | 50.30 | 5.40 | 9 37 47.01 |
| 16 | 9 45 38.89 | 39.50 | 13 29 57.2 | 54.1 | 9.338 | 47.87 | 3 55.30 | 50.48 | 5.33 | 9 41 43.57 |
| 17 | 9 49 22.74 | 23.32 | 13 10 41.8 | 38.8 | 9.317 | 48.40 | 3 42.60 | 50.66 | 5.25 | 9 45 40.12 |
| 18 | 9 53 6.09 | 6.64 | 12 51 13.8 | 10.9 | 9.297 | 48.93 | 3 29.40 | 50.85 | 5.19 | 9 49 36.68 |
| 19 | 9 56 48.96 | 49.47 | 12 31 33.5 | 30.7 | 9.277 | 49.43 | 3 15.70 | 51.04 | 5.12 | 9 53 33.23 |
| 20 | 10 0 31.34 | 31.81 | 12 11 41.3 | 38.7 | 9.257 | 49.92 | 3 1.53 | 51.24 | 5.05 | 9 57 29.79 |
| 21 | 10 4 13.26 | 13.68 | 11 51 37.5 | 35.1 | 9.237 | 50.40 | 2 46.90 | 51.45 | 4.98 | 10 1 26.34 |
| 22 | 10 7 54.72 | 55.10 | 11 31 22.3 | 20.1 | 9.218 | 50.86 | 2 31.80 | 51.66 | 4.92 | 10 5 22.90 |
| 23 | 10 11 35.73 | 36.08 | 11 10 56.3 | 54.3 | 9.199 | 51.30 | 2 16.25 | 51.87 | 4.86 | 10 9 19.45 |
| 24 | 10 15 16.31 | 16.62 | 10 50 19.6 | 17.8 | 9.181 | 51.74 | 2 0.29 | 52.09 | 4.80 | 10 13 16.01 |
| 25 | 10 18 56.47 | 56.73 | 10 29 32.8 | 31.3 | 9.163 | 52.16 | 1 43.90 | 52.31 | 4.74 | 10 17 12.56 |
| 26 | 10 22 36.21 | 36.43 | 10 8 36.1 | 34.8 | 9.147 | 52.56 | 1 27.08 | 52.53 | 4.68 | 10 21 9.12 |
| 27 | 10 26 15.55 | 15.73 | 9 47 29.8 | 28.8 | 9.131 | 52.95 | 1 9.87 | 52.75 | 4.62 | 10 25 5.67 |
| 28 | 10 29 54.51 | 54.65 | 9 26 14.2 | 13.4 | 9.116 | 53.33 | 0 52.27 | 52.98 | 4.57 | 10 29 2.23 |
| 29 | 10 33 33.11 | 33.20 | 9 4 49.9 | 49.3 | 9.101 | 53.70 | 0 34.33 | 53.21 | 4.52 | 10 32 58.78 |
| 30 | 10 37 11.36 | 11.40 | 8 43 16.9 | 16.6 | 9.087 | 54.05 | + 0 16.02 | 53.44 | 4.47 | 10 36 55.34 |
| 31 | 10 40 49.29 | 49.28 | + 8 21 35.5 | 35.5 | 9.074 | -54.39 | — 0 2.60 | 15 53.67 | 1 4.42 | 10 40 51.89 |

**Note.**—For *Mean* interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.

## AT WASHINGTON MEAN AND APPARENT NOON.

| Date. 1876. | APPARENT RIGHT ASCENSION. |  | APPARENT DECLINATION. |  | Hourly Motion. Mean Noon. |  | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. passing Merid. | Sidereal Time of Mean Noon. |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Mean Noon. | Apparent Noon. | Mean Noon. | Apparent Noon. | Right Ascension. | Declination. |  |  |  |  |
|  | h m s | s | ° ′ ″ | ″ | s | ″ | m s | ′ ″ | m s | h m s |
| Sept. 1 | 10 44 26.90 | 26.85 | + 7 59 46.1 | 46.4 | 9.061 | -54.72 | − 0 21.53 | 15 53.91 | 1 4.38 | 10 44 48.45 |
| 2 | 10 48 4.22 | 4.11 | 7 37 49.1 | 49.7 | 9.050 | 55.03 | 0 40.76 | 54.14 | 4.34 | 10 48 45.00 |
| 3 | 10 51 41.27 | 41.12 | 7 15 44.7 | 45.6 | 9.039 | 55.33 | 1 0.26 | 54.38 | 4.30 | 10 52 41.55 |
| 4 | 10 55 18.08 | 17.89 | 6 53 33.3 | 34.4 | 9.029 | 55.62 | 1 20.00 | 54.62 | 4.46 | 10 56 38.10 |
| 5 | 10 58 54.66 | 54.42 | 6 31 15.0 | 16.5 | 9.020 | 55.90 | 1 39.96 | 54.86 | 4.23 | 11 0 34.66 |
| 6 | 11 2 31.04 | 30.74 | 6 8 50.2 | 52.1 | 9.013 | 56.17 | 2 0.14 | 55.10 | 4.20 | 11 4 31.21 |
| 7 | 11 6 7.23 | 6.88 | 5 46 19.0 | 21.2 | 9.006 | 56.42 | 2 20.49 | 55.34 | 4.17 | 11 8 27.77 |
| 8 | 11 9 43.26 | 42.87 | 5 23 42.0 | 44.5 | 8.999 | 56.66 | 2 41.01 | 55.58 | 4.15 | 11 12 24.32 |
| 9 | 11 13 19.15 | 18.71 | 5 0 59.5 | 62.4 | 8.993 | 56.89 | 3 1.68 | 55.83 | 4.13 | 11 16 20.88 |
| 10 | 11 16 54.92 | 54.42 | 4 38 11.8 | 15.0 | 8.988 | 57.10 | 3 22.46 | 56.07 | 4.11 | 11 20 17.43 |
| 11 | 11 20 30.58 | 30.03 | 4 15 19.0 | 22.6 | 8.984 | 57.30 | 3 43.34 | 56.32 | 4.10 | 11 24 13.99 |
| 12 | 11 24 6.17 | 5.57 | 3 52 21.7 | 25.6 | 8.982 | 57.48 | 4 4.31 | 56.57 | 4.08 | 11 28 10.54 |
| 13 | 11 27 41.69 | 41.04 | 3 29 19.9 | 24.2 | 8.979 | 57·64 | 4 25.33 | 56.83 | 4.07 | 11 32 7.09 |
| 14 | 11 31 17.16 | 16.46 | 3 6 14.3 | 19.0 | 8.978 | 57.80 | 4 46.41 | 57.09 | 4.06 | 11 36 3.64 |
| 15 | 11 34 52.61 | 51.85 | 2 43 5.0 | 10.0 | 8.977 | 57.95 | 5 7.51 | 57.35 | 4.06 | 11 40 0.20 |
| 16 | 11 38 28.06 | 27.24 | 2 19 52.5 | 57.8 | 8.977 | 58.08 | 5 28.61 | 57.61 | 4.05 | 11 43 56.75 |
| 17 | 11 42 3.50 | 2.63 | 1 56 37.2 | 42.9 | 8.977 | 58.19 | 5 49.71 | 57.88 | 4 05 | 11 47 53.31 |
| 18 | 11 45 38.97 | 38.05 | 1 33 19.4 | 25.4 | 8.978 | 58.28 | 6 10.78 | 58.15 | 4.05 | 11 51 49.86 |
| 19 | 11 49 14.47 | 13.49 | 1 9 59.4 | 65.7 | 8.980 | 58.36 | 6 31.83 | 58.42 | 4.06 | 11 55 46.42 |
| 20 | 11 52 50.04 | 49.01 | 0 46 37.6 | 44.3 | 8.983 | 58.43 | 6 52.81 | 58.69 | 4.07 | 11 59 42.97 |
| 21 | 11 56 25.68 | 24.60 | + 0 23 14.4 | 21.5 | 8.987 | 58.49 | 7 13.71 | 58.96 | 4.09 | 12 3 39.52 |
| 22 | 12 0 1.42 | 0.29 | − 0 0 9.7 | 2.3 | 8.991 | 58.52 | 7 34.53 | 59.23 | 4.10 | 12 7 36.07 |
| 23 | 12 3 37.26 | 36.08 | 0 23 34.7 | 26.9 | 8.996 | 58.54 | 7 55.25 | 59.51 | 4.12 | 12 11 32.63 |
| 24 | 12 7 13.23 | 11.99 | 0 46 59.9 | 51.8 | 9.002 | 58.55 | 8 15.83 | 15 59.79 | 4.15 | 12 15 29.18 |
| 25 | 12 10 49.34 | 48.05 | 1 10 25.1 | 16.6 | 9.008 | 58.55 | 8 36.25 | 16 0.07 | 4.18 | 12 19 25.74 |
| 26 | 12 14 25.62 | 24.28 | 1 33 49.9 | 41.1 | 9.016 | 58.52 | 8 56.52 | 0.35 | 4.21 | 12 23 22.29 |
| 27 | 12 18 2.09 | 0.69 | 1 57 14.0 | 4.9 | 9.024 | 58.48 | 9 16.62 | 0.63 | 4.24 | 12 27 18.85 |
| 28 | 12 21 38.77 | 37.32 | 2 20 37.0 | 27.6 | 9.033 | 58.43 | 9 36.50 | 0.91 | 4.27 | 12 31 15.40 |
| 29 | 12 25 15.69 | 14.19 | 2 43 58.6 | 48.9 | 9.043 | 58.36 | 9 56.13 | 1.19 | 4.31 | 12 35 11.95 |
| 30 | 12 28 52.86 | 51.31 | 3 7 18.5 | 8.5 | 9.055 | 58.28 | 10 15.49 | 1.47 | 4.35 | 12 39 8.50 |
| Oct. 1 | 12 32 30.30 | 28.70 | 3 30 36.3 | 26.0 | 9.067 | 58.19 | 10 34.59 | 1.75 | 4.40 | 12 43 5.06 |
| 2 | 12 36 8.05 | 6.40 | 3 53 51.7 | 41.2 | 9.079 | 58.09 | 10 53.39 | 2.03 | 4.45 | 12 47 1.61 |
| 3 | 12 39 46.11 | 44.42 | 4 16 64.4 | 53.5 | 9.092 | 57.97 | 11 11.90 | 2.31 | 4.50 | 12 50 58.17 |
| 4 | 12 43 24.52 | 22.78 | 4 40 14.1 | 3.1 | 9.107 | 57.84 | 11 30.04 | 2.59 | 4.55 | 12 54 54.72 |
| 5 | 12 47 3.31 | 1.52 | 5 3 20.4 | 9.2 | 9.124 | 57.69 | 11 47.82 | 2.87 | 4.60 | 12 58 51.27 |
| 6 | 12 50 42.49 | 40.65 | 5 26 23.0 | 11.6 | 9.141 | 57.52 | 12 5.19 | 3.15 | 4.66 | 13 2 47.82 |
| 7 | 12 54 22.10 | 20.21 | 5 49 21.5 | 9.7 | 9.159 | 57.35 | 12 22.13 | 3.42 | 4.72 | 13 6 44.38 |
| 8 | 12 58 2.14 | 0.20 | 6 12 15.7 | 3.7 | 9.178 | 57.16 | 12 38.64 | 3.70 | 4.78 | 13 10 40.93 |
| 9 | 13 1 42.64 | 40.66 | 6 34 65.0 | 52.8 | 9.199 | 56.95 | 12 54.69 | 3.97 | 4.85 | 13 14 37.49 |
| 10 | 13 5 23.62 | 21.60 | 6 57 49.4 | 37.0 | 9.219 | 56.73 | 13 10.26 | 4.24 | 4.92 | 13 18 34.04 |
| 11 | 13 9 5.11 | 3.05 | 7 20 28.1 | 15.6 | 9.241 | 56.49 | 13 25.34 | 4.51 | 5.00 | 13 22 30.60 |
| 12 | 13 12 47.11 | 45.01 | 7 42 60.9 | 48.2 | 9.263 | 56.23 | 13 39.91 | 4.78 | 5.08 | 13 26 27.15 |
| 13 | 13 16 29.66 | 27.51 | 8 5 27.5 | 14.6 | 9.285 | 55.97 | 13 53.91 | 5.05 | 5.16 | 13 30 23.71 |
| 14 | 13 20 12.76 | 10.57 | 8 27 47.4 | 34.3 | 9.308 | 55.69 | 14 7.36 | 5.32 | 5.24 | 13 34 20.26 |
| 15 | 13 23 56.43 | 54.20 | 8 49 60.2 | 47.0 | 9.331 | 55.38 | 14 20.25 | 5.59 | 5.32 | 13 38 16.82 |
| 16 | 13 27 40.68 | 38.41 | 9 11 65.6 | 52.3 | 9.336 | 55.06 | 14 32.56 | 5.86 | 5.40 | 13 42 13.37 |
| 17 | 13 31 25.53 | 23.22 | 9 33 62.9 | 49.5 | 9.381 | 54.72 | 14 44.26 | 6.13 | 5.49 | 13 46 9.92 |
| 18 | 13 35 10.99 | 8.65 | 9 55 52.0 | 38.5 | 9.407 | 54.36 | 14 55.35 | 6.40 | 5.58 | 13 50 6.47 |
| 19 | 13 38 57.08 | 54.71 | 10 17 32.2 | 18.6 | 9.434 | 53.99 | 15 5.82 | 6.67 | 5.67 | 13 54 3.03 |
| 20 | 13 42 43.81 | 41.40 | 10 38 63.4 | 49.8 | 9.461 | 53.60 | 15 15.66 | 6.94 | 5.76 | 13 57 59.58 |
| 21 | 13 46 31.18 | 28.74 | 11 0 24.9 | 11.2 | 9.488 | 53.19 | 15 24.64 | 7.21 | 5.86 | 14 1 56.14 |
| 22 | 13 50 19.22 | 16.75 | 11 21 36.4 | 22.7 | 9.515 | 52.77 | 15 33.37 | 7.48 | 5.96 | 14 5 52.69 |
| 23 | 13 54 7.92 | 5.42 | 11 42 37.5 | 23.8 | 9.543 | 52.32 | 15 41.23 | 7.75 | 6.06 | 14 9 49.25 |
| 24 | 13 57 57.31 | 54.78 | 12 3 27.8 | 14.2 | 9.572 | 51.86 | 15 48.39 | 8.02 | 6.16 | 14 13 45.80 |
| 25 | 14 1 47.41 | 44.86 | 12 23 66.9 | 53.3 | 9.602 | 51.39 | 15 54.86 | 8.29 | 6.27 | 14 17 42.36 |
| 26 | 14 5 38.22 | 35.65 | 12 44 34.5 | 20.9 | 9.632 | 50.89 | 16 0.62 | 8.56 | 6.37 | 14 21 38.91 |
| 27 | 14 9 29.75 | 27.16 | 13 4 50.0 | 36.5 | 9.663 | 50.39 | 16 5.66 | 8.92 | 6.48 | 14 25 35.47 |
| 28 | 14 13 22.02 | 19.41 | 13 24 53.2 | 39.8 | 9.694 | 49.87 | 16 9.94 | 9.09 | 6.59 | 14 29 32.02 |
| 29 | 14 17 15.05 | 12.42 | 13 44 13.5 | 30.3 | 9.725 | 49.33 | 16 13.49 | 9.35 | 6.70 | 14 33 28.58 |
| 30 | 14 21 8.84 | 6.19 | 14 4 20.8 | 7.5 | 9.757 | 48.78 | 16 16.27 | 9.61 | 6.81 | 14 37 25.14 |
| 31 | 14 25 2.42 | 0.76 | 14 23 44.4 | 31.2 | 9.790 | 48.21 | 16 18.26 | 9.86 | 6.93 | 14 41 21.70 |
| 32 | 14 28 58.79 | 56.12 | −14 42 54.2 | 41.2 | 9.823 | -47.61 | −16 19.45 | 16 10.11 | 1 7.04 | 14 45 18.25 |

NOTE.—For *Mean* interval of Semidiameter passing the Meridian, subtract 0s.18 from the Sidereal Interval.

## AT WASHINGTON MEAN AND APPARENT NOON.

| Date. 1876. | APPARENT RIGHT ASCENSION. |  | APPARENT DECLINATION. |  | Hourly Motion, Mean Noon. |  | Equation of Time for Apparent Noon, | Semidiameter at Apparent Noon. | Sidereal Time of Semid. passing Merid. | Sidereal Time of Mean Noon. |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Mean Noon. | Apparent Noon. | Mean Noon. | Apparent Noon. | Right Ascension. | Declination. |  |  |  |  |
|  | h m s | s | ° ′ ″ | ″ | s | ″ | m s | ′ ″ | m s | h m s |
| Nov. 1 | 14 28 58.79 | 56.12 | —14 42 54.2 | 41.2 | 9.823 | -47.61 | —16 19.45 | 16 10.11 | 1 7.04 | 14 45 18.25 |
| 2 | 14 32 54.96 | 52.28 | 15 1 49.7 | 36.8 | 9.857 | 47.01 | 16 19.84 | 10.36 | 7.16 | 14 49 14.81 |
| 3 | 14 36 51.94 | 49.25 | 15 20 30.5 | 17.8 | 9.891 | 46.39 | 16 19.42 | 10.61 | 7.28 | 14 53 11.36 |
| 4 | 14 40 49.76 | 47.07 | 15 38 56.3 | 43.9 | 9.926 | 45.76 | 16 18.17 | 10.84 | 7.40 | 14 57 7.92 |
| 5 | 14 44 48.42 | 45.72 | 15 56 66.6 | 54.4 | 9.961 | 45.11 | 16 16.08 | 11.08 | 7.52 | 15 1 4.47 |
| 6 | 14 48 47.92 | 45.22 | 16 14 61.1 | 49.1 | 9.997 | 44.43 | 16 13.15 | 11.31 | 7.64 | 15 5 1.03 |
| 7 | 14 52 48.28 | 45.58 | 16 32 39.3 | 27.5 | 10.033 | 43.75 | 16 9.34 | 11.54 | 7.76 | 15 8 57.58 |
| 8 | 14 56 49.51 | 46.81 | 16 49 60.8 | 49.2 | 10.069 | 43.05 | 16 4.68 | 11.76 | 7.88 | 15 12 54.14 |
| 9 | 15 0 51.60 | 48.91 | 17 6 65.3 | 54.0 | 10.105 | 42.32 | 15 59.16 | 11.98 | 8.00 | 15 16 50.69 |
| 10 | 15 4 54.56 | 51.88 | 17 23 52.3 | 41.3 | 10.142 | 41.59 | 15 52.76 | 12.20 | 8.12 | 15 20 47.25 |
| 11 | 15 8 58.39 | 55.72 | 17 40 21.4 | 10.7 | 10.178 | 40.84 | 15 45.49 | 12.42 | 8.24 | 15 24 43.80 |
| 12 | 15 13 3.08 | 0.42 | 17 56 32.2 | 21.8 | 10.215 | 40.06 | 15 37.38 | 12.63 | 8.36 | 15 28 40.37 |
| 13 | 15 17 8.62 | 5.97 | 18 12 24.3 | 14.2 | 10.250 | 39.27 | 15 28.40 | 12.84 | 8.48 | 15 32 36.93 |
| 14 | 15 21 15.03 | 12.40 | 18 27 57.1 | 47.3 | 10.285 | 38.46 | 15 18.54 | 13.05 | 8.59 | 15 36 33.48 |
| 15 | 15 25 22.31 | 19.70 | 18 43 10.5 | 1.0 | 10.320 | 37.64 | 15 7.83 | 13.26 | 8.71 | 15 40 30.04 |
| 16 | 15 29 30.44 | 27.86 | 18 57 63.8 | 54.6 | 10.355 | 36.80 | 14 56.28 | 13.47 | 8.83 | 15 44 26.60 |
| 17 | 15 33 39.38 | 36.82 | 19 12 36.9 | 28.0 | 10.389 | 35.94 | 14 43.90 | 13.67 | 8.94 | 15 48 23.16 |
| 18 | 15 37 49.15 | 46.62 | 19 26 49.1 | 40.6 | 10.423 | 35.07 | 14 30.69 | 13.87 | 9.05 | 15 52 20.71 |
| 19 | 15 41 59.75 | 57.25 | 19 40 40.1 | 32.0 | 10.457 | 34.18 | 14 16.65 | 14.07 | 9.17 | 15 56 16.26 |
| 20 | 15 46 11.15 | 8.69 | 19 54 9.7 | 1.9 | 10.491 | 33.27 | 14 1.81 | 14.27 | 9.28 | 16 0 12.82 |
| 21 | 15 50 23.33 | 20.91 | 20 7 17.4 | 10.0 | 10.524 | 32.35 | 13 46.19 | 14.47 | 9.39 | 16 4 9.38 |
| 22 | 15 54 36.29 | 33.92 | 20 19 62.8 | 55.8 | 10.556 | 31.42 | 13 29.81 | 14.66 | 9.50 | 16 8 5.94 |
| 23 | 15 58 50.01 | 47.67 | 20 32 25.5 | 18.8 | 10.588 | 30.46 | 13 12.65 | 14.85 | 9.61 | 16 12 2.50 |
| 24 | 16 3 4.49 | 2.20 | 20 44 25.3 | 19.0 | 10.618 | 29.50 | 12 54.74 | 15.03 | 9.71 | 16 15 59.06 |
| 25 | 16 7 19.70 | 17.46 | 20 55 61.9 | 55.9 | 10.648 | 28.53 | 12 36.08 | 15.21 | 9.81 | 16 19 55.62 |
| 26 | 16 11 35.62 | 33.43 | 21 7 15.0 | 9.4 | 10.678 | 27.55 | 12 16.71 | 15.38 | 9.91 | 16 23 52.17 |
| 27 | 16 15 52.24 | 50.10 | 21 17 64.2 | 59.0 | 10.707 | 26.55 | 11 56.65 | 15.55 | 10.01 | 16 27 48.73 |
| 28 | 16 20 9.56 | 7.48 | 21 28 29.1 | 24.2 | 10.736 | 25.53 | 11 35.90 | 15.71 | 10.11 | 16 31 45.29 |
| 29 | 16 24 27.55 | 25.53 | 21 38 29.6 | 25.0 | 10.764 | 24.50 | 11 14.46 | 15.87 | 10.20 | 16 35 41.85 |
| 30 | 16 28 46.21 | 44.25 | 21 48 5.3 | 1.1 | 10.791 | 23.47 | 10 52.36 | 16.03 | 10.29 | 16 39 38.41 |
| Dec. 1 | 16 33 5.51 | 3.61 | 21 57 16.1 | 12.2 | 10.817 | 22.42 | 10 29.62 | 16.18 | 10.38 | 16 43 34.97 |
| 2 | 16 37 25.43 | 23.60 | 22 5 61.4 | 57.8 | 10.842 | 21.36 | 10 6.26 | 16.33 | 10.46 | 16 47 31.52 |
| 3 | 16 41 45.96 | 44.20 | 22 14 21.3 | 18.1 | 10.867 | 20.29 | 9 42.29 | 16.47 | 10.54 | 16 51 28.08 |
| 4 | 16 46 7.08 | 5.39 | 22 22 15.3 | 12.4 | 10.892 | 19.21 | 9 17.74 | 16.60 | 10.62 | 16 55 24.61 |
| 5 | 16 50 28.76 | 27.14 | 22 29 43.3 | 40.6 | 10.915 | 18.12 | 8 52.60 | 16.73 | 10.69 | 16 59 21.20 |
| 6 | 16 54 50.99 | 49.44 | 22 36 45.0 | 42.6 | 10.936 | 17.03 | 8 26.93 | 16.85 | 10.76 | 17 3 17.76 |
| 7 | 16 59 13.73 | 12.26 | 22 43 20.2 | 18.1 | 10.957 | 15.91 | 8 0.74 | 16.96 | 10.83 | 17 7 14.32 |
| 8 | 17 3 36.97 | 35.58 | 22 49 28.5 | 26.7 | 10.977 | 14.79 | 7 34.03 | 17.07 | 10.89 | 17 11 10.87 |
| 9 | 17 7 60.67 | 59.36 | 22 55 10.0 | 8.4 | 10.996 | 13.66 | 7 6.88 | 17.18 | 10.95 | 17 15 7.43 |
| 10 | 17 12 24.82 | 23.59 | 23 0 24.2 | 22.7 | 11.013 | 12.53 | 6 39.31 | 17.28 | 11.00 | 17 19 3.99 |
| 11 | 17 16 49.36 | 48.22 | 23 5 11.1 | 9.8 | 11.036 | 11.39 | 6 11.33 | 17.38 | 11.05 | 17 23 0.55 |
| 12 | 17 21 14.28 | 13.23 | 23 9 30.5 | 29.5 | 11.046 | 10.24 | 5 42.95 | 17.47 | 11.09 | 17 26 57.11 |
| 13 | 17 25 39.53 | 38.57 | 23 13 22.2 | 21.4 | 11.059 | 9.09 | 5 14.24 | 17.56 | 11.14 | 17 30 53.67 |
| 14 | 17 30 5.09 | 4.21 | 23 16 46.1 | 45.4 | 11.070 | 7.92 | 4 45.22 | 17.65 | 11.18 | 17 34 50.22 |
| 15 | 17 34 30.91 | 30.11 | 23 19 42.1 | 41.7 | 11.080 | 6.75 | 4 15.96 | 17.74 | 11.21 | 17 38 46.78 |
| 16 | 17 48 56.95 | 56.25 | 23 22 10.1 | 9.7 | 11.089 | 5.58 | 3 46.47 | 17.82 | 11.23 | 17 42 43.34 |
| 17 | 17 43 23.17 | 22.56 | 23 24 9.8 | 9.6 | 11.095 | 4.41 | 3 16.79 | 17.89 | 11.25 | 17 46 39.90 |
| 18 | 17 47 49.56 | 49.04 | 23 25 41.3 | 41.2 | 11.101 | 3.23 | 2 46.95 | 17.96 | 11.27 | 17 50 36.46 |
| 19 | 17 52 16.05 | 15.62 | 23 26 44.6 | 44.6 | 11.104 | 2.05 | 2 17.01 | 18.03 | 11.29 | 17 54 33.02 |
| 20 | 17 56 42.62 | 42.28 | 23 27 19.6 | 19.6 | 11.107 | - 0.87 | 1 47.00 | 18.09 | 11.30 | 17 58 29.58 |
| 21 | 18 1 9.22 | 8.97 | 23 27 26.4 | 26.4 | 11.108 | + 0.31 | 1 16.95 | 18.15 | 11.31 | 18 2 26.14 |
| 22 | 18 5 35.83 | 35.68 | 23 27 4.7 | 4.6 | 11.108 | 1.49 | 0 46.89 | 18.21 | 11.31 | 18 6 22.70 |
| 23 | 18 10 2.39 | 2.34 | 23 26 14.7 | 14.6 | 11.106 | 2.67 | — 0 16.87 | 18.26 | 11.31 | 18 10 19.26 |
| 24 | 18 14 28.89 | 28.93 | 23 24 56.5 | 56.4 | 11.102 | 3.84 | + 0 13.07 | 18.31 | 11.30 | 18 14 15.82 |
| 25 | 18 18 55.29 | 55.41 | 23 23 10.1 | 10.0 | 11.097 | 5.02 | 0 42.01 | 18.35 | 11.29 | 18 18 12.38 |
| 26 | 18 23 21.54 | 21.76 | 23 20 55.5 | 55.4 | 11.091 | 6.19 | 1 12.62 | 18.39 | 11.27 | 18 22 8.94 |
| 27 | 18 27 47.63 | 47.94 | 23 18 12.8 | 12.6 | 11.083 | 7.36 | 1 42.17 | 18.41 | 11.24 | 18 26 5.50 |
| 28 | 18 32 13.52 | 13.92 | 23 15 2.1 | 1.8 | 11.075 | 8.52 | 2 11.52 | 18.43 | 11.21 | 18 30 2.05 |
| 29 | 18 36 39.19 | 39.68 | 23 11 23.5 | 23.1 | 11.065 | 9.68 | 2 40.64 | 18.45 | 11.18 | 18 33 58.60 |
| 30 | 18 41 4.69 | 5.18 | 23 7 17.0 | 16.4 | 11.053 | 10.84 | 3 9.50 | 18.46 | 11.15 | 18 37 55.17 |
| 31 | 18 45 29.73 | 30.40 | 23 2 42.9 | 42.2 | 11.041 | 11.99 | 3 38.06 | 18.46 | 11.11 | 18 41 51.73 |
| 32 | 18 49 54.54 | 55.29 | —22 57 41.2 | 40.3 | 11.028 | +13.14 | + 4 6.32 | 16 18.46 | 11.06 | 18 45 48.29 |

NOTE.—For *Mean* interval of Semidiameter passing the Meridian, subtract 0s.19 from the Sidereal Interval.

## WASHINGTON MERIDIAN.

| Date. 1875. | Mean Time of Meridian Transit. | Diff. for 1 h. of Long. | Sidereal Time of Semid. passing Merid. | Stars. | Bright Limb. | Date. 1875. | Mean Time of Meridian Transit. | Diff. for 1 h. of Long. | Sidereal Time of Semid. passing Merid. | Stars. | Bright Limb. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | h m | m | s | | | | h m | m | s | | |
| Jan. 0 | 3 13.67 | 1.863 | 65.12 | 145 .. 151 | I. | Mar. 1 | 4 33.61 | 2.307 | 72.32 | 20 .. 27 | I. |
| 1 | 3 57.61 | 1.806 | 64.23 | 149 .. 155 | I. | 2 | 5 31.25 | 2.493 | 75.13 | 28 .. 35 | I. |
| 2 | 4 40.68 | 1.792 | 64.05 | 155 .. 162 | I. | 3 | 6 32.81 | 2.621 | 77.02 | 34 .. 38 | I. |
| 3 | 5 24.04 | 1.832 | 64.76 | 161 .. 6 | I. | 4 | 7 36.25 | 2.642 | 77.28 | 42 .. 47 | I. |
| 4 | 6 9.11 | 1.935 | 66.46 | 5 .. 12 | I. | 5 | 8 38.73 | 2.546 | 75.82 | 49 .. 57 | I. |
| 5 | 6 57.42 | 2.103 | 69.13 | 10 .. 16 | I. | 6 | 9 37.87 | 2.375 | 73.19 | 58 .. 65 | I. |
| 6 | 7 50.49 | 2.329 | 72.56 | 17 .. 24 | I. | 7 | 10 32.56 | 2.185 | 70.25 | 64 .. 70 | I. |
| 7 | 8 49.34 | 2.576 | 76.17 | 25 .. 33 | I. | 8 | 11 22.96 | 2.023 | 67.67 | 69 .. 76 | I. |
| 8 | 9 53.72 | 2.771 | 78.89 | 35 .. 38 | I. | 9 | 12 10.02 | 1.908 | 65.78 | 75 .. 82 | I. |
| 9 | 11 1.31 | 2.828 | 79.68 | 39 .. 46 | I. | 10 | 12 54.95 | 1.845 | 64.76 | 82 .. 87 | II |
| 10 | 12 8.24 | 2.720 | 78.11 | 47 .. 55 | I. | 11 | 13 38.98 | 1·832 | 64.58 | 86 .. 92 | II. |
| 11 | 13 10.98 | 2.497 | 74.88 | 58 .. 63 | II. | 12 | 14 23.24 | 1.862 | 65.14 | 92 .. 98 | II. |
| 12 | 14 7.87 | 2.246 | 71.19 | 64 .. 70 | II. | 13 | 15 8.64 | 1.925 | 66.27 | 97 .. 102 | II. |
| 13 | 14 59.13 | 2.033 | 67.90 | 70 . 76 | II. | 14 | 15 55.81 | 2.007 | 67.65 | 102 .. 108 | II. |
| 14 | 15 45.94 | 1.880 | 65.51 | 75 .. 82 | II. | 15 | 16 44.96 | 2.087 | 68.97 | 108 .. 114 | II. |
| 15 | 16 29.88 | 1.792 | 64.07 | 82 .. 87 | II. | 16 | 17 35.79 | 2.143 | 69.92 | 115 .. 119 | II. |
| 16 | 17 12.39 | 1.760 | 63.59 | 86... 92 | II. | 17 | 18 27.51 | 2.158 | 70.19 | 119 .. 126 | II. |
| 17 | 17 54.79 | 1.781 | 63.95 | 91 .. 98 | II. | 18 | 19 19.05 | 2.128 | 69.66 | 126 .. 132 | II. |
| 18 | 18 38.21 | 1.844 | 64.99 | 96 .. 101 | II. | 19 | 20 9.40 | 2.065 | 68.57 | 133 .. 137 | II. |
| 19 | 19 23.50 | 1.934 | 66.45 | 101 .. 106 | II. | 20 | 20 57.98 | 1.985 | 67.22 | 138 .. 145 | II. |
| 20 | 20 11.12 | 2.034 | 67.97 | 107 .. 113 | II. | 21 | 21 44.71 | 1.911 | 65.94 | 144 .. 149 | II. |
| 21 | 21 1.03 | 2.119 | 69.20 | 114 .. 118 | II. | 22 | 22 29.92 | 1.862 | 65.11 | | II. |
| 22 | 21 52.53 | 2.163 | 69.86 | | II. | 23 | 23 14.39 | 1.852 | 64.92 | | II. |
| 23 | 22 44.45 | 2.153 | 69.66 | | II. | 24 | 23 59.22 | 1.892 | 65.55 | | II. |
| 24 | 23 35.49 | 2.092 | 68.68 | | II. | 26 | 0 45.61 | 1.982 | 66.99 | | I. |
| 26 | 0 24.67 | 2.003 | 67.24 | | I. | 27 | 1 34.76 | 2.122 | 69.26 | | I. |
| 27 | 1 11.60 | 1.910 | 65.73 | | I. | 28 | 2 27.77 | 2.301 | 72.09 | | I |
| 28 | 1 56.48 | 1.836 | 64.56 | | I. | 29 | 3 25.22 | 2.484 | 74.89 | 28 .. 35 | I. |
| 29 | 2 40.00 | 1.798 | 64.01 | 153 .. 160 | I. | 30 | 4 26.59 | 2.615 | 76.90 | 34 .. 38 | I. |
| 30 | 3 23.17 | 1.808 | 64.24 | 159 .. 4 | I. | 31 | 5 29.96 | 2.642 | 77.31 | 39 .. 45 | I. |
| 31 | 4 7.23 | 1.872 | 65.37 | 3 .. 8 | I. | Apr. 1 | 6 32.55 | 2.553 | 76.01 | 47 .. 55 | I. |
| Feb. 1 | 4 53.48 | 1.994 | 67.40 | 8 .. 15 | I. | 2 | 7 31.88 | 2.383 | 73.46 | 55 .. 62 | I. |
| 2 | 5 43.39 | 2.174 | 70.28 | 15 .. 21 | I. | 3 | 8 26.74 | 2.191 | 70.50 | 63 .. 67 | I. |
| 3 | 6 38.11 | 2.391 | 73.59 | 22 .. 29 | I. | 4 | 9 17.19 | 2.022 | 67 76 | 68 .. 73 | I. |
| 4 | 7 38.04 | 2.597 | 76.57 | 30 .. 35 | I. | 5 | 10 4.15 | 1.900 | 65.69 | 74 .. 81 | I. |
| 5 | 8 42.12 | 2.721 | 78.33 | 37 .. 43 | I. | 6 | 10 48.82 | 1.831 | 64.53 | 80 .. 85 | I. |
| 6 | 9 47.64 | 2.710 | 78·09 | 45 .. 51 | I. | 7 | 11 32.45 | 1.813 | 64.19 | 84 .. 90 | I. |
| 7 | 10 51.22 | 2.569 | 75.97 | 53 .. 60 | I. | 8 | 12 16.20 | 1.839 | 64.62 | 89 .. 95 | II. |
| 8 | 11 50.41 | 2.360 | 72.85 | 61 .. 67 | I. | 9 | 13 1.02 | 1.902 | 65.68 | 95 .. 100 | II. |
| 9 | 12 44.47 | 2.151 | 69.65 | 68 .. 73 | II. | 10 | 13 47.64 | 1.985 | 67.09 | 100 .. 105 | II. |
| 10 | 13 33.96 | 1.983 | 67.04 | 74 .. 80 | II. | 11 | 14 36.32 | 2.071 | 68.54 | 106 .. 113 | II. |
| 11 | 14 20.09 | 1.872 | 65.29 | 79 .. 84 | II. | 12 | 15 26.87 | 2.137 | 69.64 | 113 .. 117 | II. |
| 12 | 15 4.26 | 1.818 | 64.44 | 84 .. 90 | II. | 13 | 16 18.52 | 2.160 | 70.08 | 117 .. 124 | II. |
| 13 | 15 47.74 | 1.814 | 64.45 | 89 .. 94 | II. | 14 | 17 10.17 | 2.136 | 69.76 | 125 .. 129 | II. |
| 14 | 16 31.69 | 1.855 | 65.19 | 94 .. 98 | II. | 15 | 18 0.73 | 2.071 | 68.76 | 130 .. 135 | II. |
| 15 | 17 17.03 | 1.928 | 66.43 | 99 .. 103 | II. | 16 | 18 49.46 | 1.988 | 67.43 | 135 .. 141 | II. |
| 16 | 18 4.33 | 2.016 | 67.88 | 104 .. 111 | II. | 17 | 19 36.21 | 1.909 | 66.10 | 141 .. 147 | II. |
| 17 | 18 53.73 | 2.098 | 69.18 | 111 .. 116 | II. | 18 | 20 21.29 | 1.853 | 65.11 | 147 .. 152 | II. |
| 18 | 19 44.83 | 2.153 | 69.99 | 116 .. 123 | II. | 19 | 21 5.46 | 1.835 | 64.74 | 152 .. 158 | II. |
| 19 | 20 36.70 | 2.160 | 70.04 | 123 .. 128 | II. | 20 | 21 49.75 | 1.865 | 65.16 | | II. |
| 20 | 21 28.15 | 2.119 | 69.32 | 129 .. 134 | II. | 21 | 22 35.39 | 1.949 | 66.49 | | II. |
| 21 | 22 18.17 | 2.045 | 68.05 | | II. | 22 | 23 23.73 | 2.090 | 68.72 | | II. |
| 22 | 23 6.23 | 1.960 | 66.61 | | II. | 24 | 0 16.08 | 2.280 | 71.66 | | I. |
| 23 | 23 52.31 | 1.885 | 65.38 | | II. | 25 | 1 13.32 | 2.490 | 74.84 | | I |
| 25 | 0 36.92 | 1.839 | 64.61 | | I. | 26 | 2 15.30 | 2.661 | 77.39 | | I. |
| 26 | 1 20.90 | 1.833 | 64.56 | | I. | 27 | 3 20.25 | 2.725 | 78.39 | 37 .. 43 | I. |
| 27 | 2 5.32 | 1.878 | 65.33 | 1 .. 7 | I. | 28 | 4 25.08 | 2.650 | 77.36 | 44 .. 51 | I. |
| 28 | 2 51.44 | 1.975 | 66.98 | 7 .. 13 | I. | 29 | 5 26.68 | 2.469 | 74.74 | 52 .. 60 | I. |
| 29 | 3 40.51 | 2.123 | 69.42 | 14 .. 19 | I. | 30 | 6 23.33 | 2.251 | 71.48 | 61 .. 67 | I. |
| 30 | 4 33.61 | 2.307 | 72.32 | 20 .. 27 | I. | 31 | 7 14 89 | 2.054 | 68.36 | 67 .. 72 | I. |

NOTE.—The stars are those of the following list which are within $30^{\mathrm{m}}$ of the Moon in right-ascension at the time of its culmination at Washington. Those selected for Washington are the two which immediately precede and the two which follow the moon.

## WASHINGTON MERIDIAN.

| Date. 1876. | Mean Time of Meridian Transit. | Diff. for 1 h. of Long. | Sidereal Time of Semid. passing Merid. | Stars. | Bright Limb. | Date. 1876. | Mean Time of Meridian Transit. | Diff. for 1 h. of Long. | Sidereal Time of Semid. passing Merid. | Stars. | Bright Limb. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | h m | m | s | | | | h m | m | s | | |
| May 1 | 7 14.89 | 2.054 | 68.36 | 67 .. 72 | I. | July 1 | 8 23.72 | 1.957 | 66.68 | 99 .. 105 | I. |
| 2 | 8 2.29 | 1.906 | 65.94 | 72 .. 78 | I. | 2 | 9 11.79 | 2.049 | 68.10 | 104 .. 112 | I. |
| 3 | 8 46.84 | 1.816 | 64.39 | 77 .. 83 | I. | 3 | 10 1.92 | 2.123 | 69.21 | 112 .. 117 | I. |
| 4 | 9 29.92 | 1.783 | 63.76 | 83 .. 88 | I. | 4 | 10 53.35 | 2.153 | 69.66 | 117 .. 124 | I. |
| 5 | 10 12.81 | 1.799 | 63.97 | 88 .. 93 | I. | 5 | 11 44.86 | 2.129 | 69.24 | 124 .. 129 | II |
| 6 | 10 56.59 | 1.856 | 64.88 | 92 .. 98 | I. | 6 | 12 35.17 | 2.056 | 68.08 | 129 .. 134 | II. |
| 7 | 11 42.11 | 1.941 | 66.26 | 99 .. 103 | I. | 7 | 13 23.33 | 1.956 | 66.50 | 135 .. 141 | II. |
| 8 | 12 29.84 | 2.036 | 67.80 | 103 .. 109 | II. | 8 | 14 9.03 | 1.855 | 64.90 | 140 .. 147 | II. |
| 9 | 13 19.73 | 2.116 | 69.10 | 109 .. 114 | II. | 9 | 14 52.51 | 1.774 | 63.60 | 146 .. 152 | II. |
| 10 | 14 11.13 | 2.158 | 69.81 | 115 .. 121 | II. | 10 | 15 34.46 | 1.729 | 62.90 | 151 .. 158 | II. |
| 11 | 15 2.91 | 2.147 | 69.72 | 120 .. 127 | II. | 11 | 16 15.86 | 1.730 | 62.98 | 155 .. 162 | II. |
| 12 | 15 53.80 | 2.087 | 68.86 | 128 .. 133 | II. | 12 | 16 57.92 | 1.785 | 63.96 | 162 .. 6 | II. |
| 13 | 16 42.87 | 1.999 | 67.48 | 133 .. 138 | II. | 13 | 17 42.00 | 1.900 | 65.88 | 6 .. 13 | II. |
| 14 | 17 29.71 | 1.906 | 66.00 | 138 .. 144 | II. | 14 | 18 29.60 | 2.078 | 68.76 | 13 .. 18 | II. |
| 15 | 18 14.52 | 1.832 | 64.80 | 144 .. 150 | II. | 15 | 19 22.16 | 2.311 | 72.33 | 17 .. 24 | II. |
| 16 | 18 57.95 | 1.794 | 64.16 | 149 .. 155 | II. | 16 | 20 20.64 | 2.562 | 76.00 | 25 .. 33 | II. |
| 17 | 19 41.00 | 1.802 | 64.27 | 155 .. 162 | II. | 17 | 21 24.69 | 2.758 | 78.77 | | II. |
| 18 | 20 24.90 | 1.866 | 65.25 | 162 .. 6 | II. | 18 | 22 32.00 | 2.818 | 79.60 | | II. |
| 19 | 21 11.06 | 1.992 | 67.18 | 5 .. 12 | II. | 19 | 23 38.78 | 2.718 | 78.10 | | II. |
| 20 | 22 0.98 | 2.179 | 70.15 | | II. | 21 | 0 41.63 | 2.509 | 75.08 | | I. |
| 21 | 22 56.00 | 2.413 | 73.66 | | II. | 22 | 1 38.99 | 2.276 | 71.62 | | I. |
| 22 | 23 56.78 | 2.646 | 77.01 | | II. | 23 | 2 31.11 | 2.079 | 68.62 | | I. |
| 24 | 1 2.36 | 2.795 | 79.23 | | I. | 24 | 3 19.22 | 1.942 | 66.49 | 77 .. 82 | I. |
| 25 | 2 9.82 | 2.793 | 79.23 | | I. | 25 | 4 4.82 | 1.869 | 65.35 | 83 .. 88 | I. |
| 26 | 3 15.28 | 2.638 | 77.09 | | I. | 26 | 4 49.37 | 1.853 | 65.12 | 88 .. 93 | I. |
| 27 | 4 15.83 | 2.402 | 73.67 | 58 .. 65 | I. | 27 | 5 34.12 | 1.884 | 65.66 | 93 .. 98 | I. |
| 28 | 5 10.55 | 2.165 | 70.09 | 64 .. 70 | I. | 28 | 6 20.08 | 1.950 | 66.74 | 99 .. 102 | I. |
| 29 | 6 0.10 | 1.976 | 67.09 | 70 .. 76 | I. | 29 | 7 7.86 | 2.033 | 68.04 | 103 .. 109 | I. |
| 30 | 6 45.86 | 1.849 | 65.02 | 75 .. 82 | I. | 30 | 7 57.59 | 2.107 | 69.19 | 109 .. 114 | I. |
| 31 | 7 29.34 | 1.785 | 63.93 | 82 .. 87 | I. | 31 | 8 48.76 | 2.149 | 69.82 | 115 .. 121 | I. |
| June 1 | 8 11.98 | 1.777 | 63.75 | 86 .. 91 | I. | Aug. 1 | 9 40.38 | 2.142 | 69.64 | 121 .. 127 | I. |
| 2 | 8 55.04 | 1.817 | 64.36 | 91 .. 98 | I. | 2 | 10 31.23 | 2.086 | 68.66 | 128 .. 133 | I. |
| 3 | 9 39.52 | 1.894 | 65.56 | 96 .. 101 | I. | 3 | 11 20.27 | 1.996 | 67.17 | 133 .. 138 | I. |
| 4 | 10 26.12 | 1.991 | 67.06 | 101 .. 108 | I. | 4 | 12 6.97 | 1.896 | 65.52 | 138 .. 145 | II. |
| 5 | 11 15.03 | 2.083 | 68.51 | 106 .. 114 | I. | 5 | 12 51.37 | 1.807 | 64.07 | 144 .. 150 | II. |
| 6 | 12 5.85 | 2.144 | 69.49 | 114 .. 118 | II. | 6 | 13 33.95 | 1.747 | 63.09 | 149 .. 155 | II. |
| 7 | 12 57.56 | 2.154 | 69.66 | 118 .. 125 | II. | 7 | 14 15.56 | 1.727 | 62.79 | 154 .. 161 | II. |
| 8 | 13 48.84 | 2.110 | 68.98 | 126 .. 132 | II. | 8 | 14 57.24 | 1.755 | 63.33 | 161 .. 5 | II. |
| 9 | 14 38.50 | 2.023 | 67.67 | 132 .. 137 | II. | 9 | 15 40.21 | 1.835 | 64.75 | 4 .. 9 | II. |
| 10 | 15 25 83 | 1.921 | 66.10 | 137 .. 143 | II. | 10 | 16 25.78 | 1.973 | 67.06 | 9 .. 16 | II. |
| 11 | 16 10.81 | 1.830 | 64.65 | 142 .. 148 | II. | 11 | 17 15.31 | 2.164 | 70.13 | 16 .. 23 | II. |
| 12 | 16 53.90 | 1.768 | 63.65 | 148 .. 153 | II. | 12 | 18 9.87 | 2.388 | 73.55 | 23 .. 29 | II. |
| 13 | 17 35.99 | 1.745 | 63.33 | 153 .. 159 | II. | 13 | 19 9.76 | 2.596 | 76.58 | 30 .. 36 | II. |
| 14 | 18 18.18 | 1.779 | 63.88 | 158 .. 3 | II. | 14 | 20 13.80 | 2.719 | 78.33 | 37 .. 43 | II. |
| 15 | 19 1.86 | 1.871 | 65.39 | 1 .. 8 | II. | 15 | 21 19.24 | 2.707 | 78.09 | | II. |
| 16 | 19 48.49 | 2.027 | 67.89 | 8 .. 14 | II. | 16 | 22 22.80 | 2.571 | 76.06 | | II. |
| 17 | 20 39.65 | 2.248 | 71.28 | 15 .. 20 | II. | 17 | 23 22.19 | 2.375 | 73.12 | | II. |
| 18 | 21 36.65 | 2.506 | 75.10 | | II. | 19 | 0 16.80 | 2.183 | 70.18 | | I. |
| 19 | 22 39.71 | 2.737 | 78.38 | | II. | 20 | 1 7.27 | 2.034 | 67.83 | | I |
| 20 | 23 47.15 | 2.852 | 80.01 | | II. | 21 | 1 54.85 | 1.941 | 66.41 | | I. |
| 22 | 0 55.32 | 2.794 | 79.19 | | I. | 22 | 2 40.90 | 1.905 | 65.89 | 85 .. 90 | I. |
| 23 | 2 0.21 | 2.595 | 76 37 | | I. | 23 | 3 26.68 | 1.968 | 66.16 | 91 .. 96 | I. |
| 24 | 2 59.47 | 2.344 | 72.70 | | I. | 24 | 4 13.25 | 1.918 | 67.03 | 95 .. 101 | I. |
| 25 | 3 52.85 | 2.115 | 69.26 | 68 .. 73 | I. | 25 | 5 1.30 | 2.038 | 68.21 | 101 .. 106 | I. |
| 26 | 4 41.43 | 1.945 | 66.59 | 74 .. 81 | I. | 26 | 5 51.06 | 2.107 | 69.34 | 106 .. 114 | I. |
| 27 | 5 26 75 | 1.843 | 64.93 | 80 .. 85 | I. | 27 | 6 42.28 | 2.154 | 70.04 | 114 .. 118 | I. |
| 28 | 6 10.37 | 1.802 | 64.25 | 84 .. 90 | I. | 28 | 7 34.11 | 2.156 | 70.03 | 118 .. 125 | I. |
| 29 | 6 53.66 | 1.815 | 64.46 | 89 .. 95 | I. | 29 | 8 25.42 | 2.112 | 69.24 | 126 .. 132 | I. |
| 30 | 7 37.82 | 1.872 | 65.35 | 95 .. 100 | I. | 30 | 9 15.20 | 2.032 | 67.91 | 131 .. 137 | I. |
| 31 | 8 23.72 | 1.957 | 66.68 | 100 .. 105 | I. | 31 | 10 2.83 | 1.936 | 66.30 | 137 .. 143 | I. |

## WASHINGTON MERIDIAN.

| Date. 1876. | Mean Time of Meridian Transit. | Diff. for 1 h. of Long. | Sidereal Time of Semid. passing Merid. | Stars. | Bright Limb. | Date. 1876. | Mean Time of Meridian Transit. | Diff. for 1 h. of Long. | Sidereal Time of Semid. passing Merid. | Stars. | Bright Limb. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | h m | m | s | | | | h m | m | s | | |
| Sept. 1 | 10 48.19 | 1.847 | 64.78 | 142 .. 148 | I. | Nov. 1 | 11 50.09 | 2.251 | 71.13 | 16 .. 23 | II. |
| 2 | 11 31.67 | 1.782 | 63.66 | 148 .. 153 | I. | 2 | 12 46.68 | 2.463 | 74.35 | 23 .. 29 | II. |
| 3 | 12 13.99 | 1.752 | 63.14 | 153 .. 159 | II. | 3 | 13 47.99 | 2.632 | 76.87 | 31 .. 36 | II. |
| 4 | 12 56.09 | 1.765 | 63.38 | 158 .. 3 | II. | 4 | 14 52.20 | 2.693 | 77.81 | 38 .. 43 | II. |
| 5 | 13 39.07 | 1.826 | 64.45 | 2 .. 8 | II. | 5 | 15 56.25 | 2.620 | 76.85 | 45 .. 52 | II. |
| 6 | 14 24.13 | 1.939 | 66.37 | 8 .. 14 | II. | 6 | 16 57.23 | 2.450 | 74.38 | 53 .. 60 | II. |
| 7 | 15 12.50 | 2.100 | 69.02 | 14 .. 21 | II. | 7 | 17 53.59 | 2.248 | 71.36 | 61 .. 67 | II. |
| 8 | 16 5.17 | 2.294 | 72.09 | 21 .. 27 | II. | 8 | 18 45.31 | 2.070 | 68.56 | 68 . 73 | II. |
| 9 | 17 2.56 | 2.484 | 76.00 | 28 .. 35 | II. | 9 | 19 33.32 | 1.942 | 66.47 | 73 .. 79 | II. |
| 10 | 18 3.95 | 2.615 | 76.92 | 36 .. 41 | II. | 10 | 20 18.98 | 1.873 | 65.29 | 79 .. 83 | II. |
| 11 | 19 7.26 | 2.637 | 77.22 | 42 .. 48 | II. | 11 | 21 3.67 | 1.860 | 65.00 | 83 .. 89 | II. |
| 12 | 20 9.70 | 2.547 | 75.84 | 50 .. 57 | II. | 12 | 21 48.65 | 1.896 | 65.54 | | II. |
| 13 | 21 8.97 | 2.386 | 73.38 | 59 .. 66 | II. | 13 | 22 34.98 | 1.970 | 66.69 | | II. |
| 14 | 22 4.11 | 2.212 | 70.68 | | II. | 14 | 23 23.36 | 2.063 | 68.15 | | II. |
| 15 | 22 55.36 | 2.067 | 68.36 | | II. | 16 | 0 13.96 | 2.149 | 69.51 | | I. |
| 16 | 23 43.71 | 1.972 | 66.82 | | II. | 17 | 1 6.26 | 2.200 | 70.35 | | I. |
| 18 | 0 30.41 | 1.929 | 66.15 | | I. | 18 | 1 59.16 | 2.195 | 70.34 | | I |
| 19 | 1 16.68 | 1.935 | 66.26 | | I. | 19 | 2 51.21 | 2.133 | 69.43 | 125 .. 130 | I. |
| 20 | 2 3.59 | 1.979 | 67.05 | | I. | 20 | 3 41.24 | 2.031 | 67.89 | 129 .. 135 | I. |
| 21 | 2 51.86 | 2.047 | 68.20 | 99 .. 103 | I. | 21 | 4 28.60 | 1.918 | 66.10 | 135 .. 141 | I. |
| 22 | 3 41.86 | 2.118 | 69.39 | 104 .. 111 | I. | 22 | 5 13.32 | 1.815 | 64.46 | 141 .. 147 | I. |
| 23 | 4 33.35 | 2.167 | 70.24 | 111 .. 116 | I. | 23 | 5 55.95 | 1.744 | 63.29 | 146 .. 152 | I. |
| 24 | 5 25.58 | 2.177 | 70.42 | 116 .. 124 | I. | 24 | 6 37.37 | 1.715 | 62.78 | 152 .. 157 | I. |
| 25 | 6 17.46 | 2.138 | 69.81 | 123 .. 129 | I. | 25 | 7 18.67 | 1.736 | 63.10 | 156 .. 162 | I. |
| 26 | 7 7.92 | 2.061 | 68.57 | 129 .. 134 | I. | 26 | 8 1.15 | 1.813 | 64.35 | 162 .. 7 | I. |
| 27 | 7 56.27 | 1.966 | 66.99 | 135 .. 139 | I. | 27 | 8 46.19 | 1.951 | 66.55 | 7 .. 13 | I. |
| 28 | 8 42.33 | 1.875 | 65.41 | 139 .. 148 | I. | 28 | 9 35.25 | 2.149 | 69.61 | 13 .. 18 | I. |
| 29 | 9 26.43 | 1.805 | 64.18 | 145 .. 152 | I. | 29 | 10 29.62 | 2.388 | 73.22 | 19 .. 25 | I. |
| 30 | 10 9.24 | 1.769 | 63.53 | 151 .. 157 | I. | 30 | 11 29.79 | 2.620 | 76.60 | 27 .. 35 | I. |
| Oct. 1 | 10 51.69 | 1.776 | 63.56 | 155 .. 162 | I. | Dec. 1 | 12 34.72 | 2.766 | 78.72 | 36 .. 40 | II. |
| 2 | 11 34.85 | 1.829 | 64.45 | 162 .. 6 | II. | 2 | 13 41.45 | 2.763 | 78.67 | 42 .. 47 | II. |
| 3 | 12 19.89 | 1.934 | 66.17 | 6 .. 13 | II. | 3 | 14 46.27 | 2.616 | 76.65 | 50 .. 57 | II. |
| 4 | 13 8.06 | 2.087 | 68.66 | 13 .. 18 | II. | 4 | 15 46.44 | 2.394 | 73.45 | 59 .. 66 | II. |
| 5 | 14 0.32 | 2.273 | 71.60 | 17 .. 24 | II. | 5 | 16 41.16 | 2.174 | 70.17 | 67 .. 71 | II. |
| 6 | 14 57.17 | 2 460 | 74.46 | 25 .. 33 | II. | 6 | 17 31.15 | 2.003 | 67.48 | 71 .. 77 | II. |
| 7 | 15 57.99 | 2.592 | 76.50 | 35 .. 38 | II. | 7 | 18 17.78 | 1.894 | 65.72 | 76 .. 82 | II. |
| 8 | 17 0.82 | 2.622 | 76.97 | 39 .. 46 | II. | 8 | 19 2.56 | 1.848 | 64.95 | 83 .. 88 | II. |
| 9 | 18 2.98 | 2.539 | 75.77 | 47 .. 55 | II. | 9 | 19 46.95 | 1.859 | 65.08 | 88 .. 94 | II. |
| 10 | 19 2.09 | 2.381 | 73.40 | 56 .. 62 | II. | 10 | 20 32.17 | 1.916 | 65.94 | 92 .. 98 | II. |
| 11 | 19 57.09 | 2.205 | 70.68 | 63 .. 68 | II. | 11 | 21 19.16 | 2.003 | 67.28 | 99 .. 103 | II. |
| 12 | 20 48.12 | 2.055 | 68.27 | 68 .. 74 | II. | 12 | 22 8.37 | 2.097 | 68.73 | | II. |
| 13 | 21 36.11 | 1.954 | 66.56 | 74 .. 81 | II. | 13 | 22 59.67 | 2.170 | 69.83 | | II. |
| 14 | 22 22.31 | 1.906 | 65.73 | | II. | 14 | 23 52.18 | 2.195 | 70.19 | | II. |
| 15 | 23 7.96 | 1.908 | 65.73 | | II. | 16 | 0 44.57 | 2.159 | 69.64 | | I. |
| 16 | 23 54.21 | 1.953 | 66.46 | | I. | 17 | 1 35.41 | 2.070 | 68.29 | | I. |
| 18 | 0 41.92 | 2.027 | 67.67 | | I. | 18 | 2 23.73 | 1.954 | 66.50 | | I. |
| 19 | 1 31.56 | 2.109 | 69.02 | | I. | 19 | 3 9.22 | 1.839 | 64.68 | 138 .. 145 | I. |
| 20 | 2 23.03 | 2.175 | 70.12 | | I. | 20 | 3 52.18 | 1.746 | 63.19 | 144 .. 150 | I. |
| 21 | 3 15.62 | 2.198 | 70.58 | 115 .. 118 | I. | 21 | 4 33.32 | 1.690 | 62.28 | 149 .. 155 | I. |
| 22 | 4 8.16 | 2.170 | 70.20 | 119 .. 126 | I. | 22 | 5 13.65 | 1.679 | 62.14 | 154 .. 161 | I. |
| 23 | 4 59.43 | 2.095 | 69.08 | 127 .. 132 | I. | 23 | 5 54.33 | 1.721 | 62.89 | 160 .. 4 | I. |
| 24 | 5 48.52 | 1.995 | 67.48 | 133 .. 137 | I. | 24 | 6 36.72 | 1.822 | 64.57 | 8 .. 8 | I. |
| 25 | 6 35.16 | 1.893 | 65.80 | 138 .. 143 | I. | 25 | 7 22.29 | 1.987 | 67.22 | 9 .. 16 | I. |
| 26 | 7 19.50 | 1.809 | 64.40 | 143 .. 149 | I. | 26 | 8 12.53 | 2.211 | 70.70 | 15 .. 22 | I. |
| 27 | 8 2.27 | 1.762 | 63.53 | 149 .. 154 | I. | 27 | 9 8.64 | 2.469 | 74.55 | 23 .. 29 | I. |
| 28 | 8 44.39 | 1.756 | 63.36 | 153 .. 160 | I. | 28 | 10 10.81 | 2.701 | 77.85 | 30 .. 35 | I |
| 29 | 9 26.96 | 1.800 | 64.05 | 159 .. 4 | I. | 29 | 11 17.42 | 2.819 | 79.49 | 38 .. 43 | I. |
| 30 | 10 11.24 | 1.899 | 65.62 | 3 .. 8 | I. | 30 | 12 24.91 | 2.773 | 78.82 | 46 .. 52 | II. |
| 31 | 10 58.54 | 2.053 | 68.06 | 9 .. 16 | I. | 31 | 13 29.53 | 2.597 | 76.27 | 55 .. 62 | II. |
| 32 | 11 50.09 | 2 251 | 71.13 | 16 .. 24 | II. | 32 | 14 29.08 | 2.363 | 73.10 | 63 .. 68 | II. |

NOTE.—The stars are those of the following list which are within 30$^{m}$ of the Moon in right-ascension at the time of its culmination at Washington. Those selected for Washington are the two which immediately precede and the two which follow the moon.

## MEAN PLACES FOR 1876.0.

| No. | Name. | Magnitude. | Right Ascension. | Annual Variation. | Declination. | Annual Variation. |
|---|---|---|---|---|---|---|
| | | | h m s | s | ° ′ ″ | ″ |
| 1 | B. A. C. 57 . | 6.7 | 0 11 25.11 | +3.067 | + 0 59 56.6 | +20.02 |
| 2 | *d* Piscium . . | 6.5 | 0 14 13.13 | 3.086 | 7 30 6.3 | 20.06 |
| 3 | 44 Piscium . . | 6.7 | 0 19 2.85 | 3.075 | 1 15 11.6 | 19.99 |
| 4 | 51 Piscium . . | 6 | 0 25 59.97 | 3.090 | 6 16 19.3 | 20.00 |
| 5 | 60 Piscium . . | 6.7 | 0 40 58.88 | 3.098 | 6 3 50.8 | 19.74 |
| 6 | δ Piscium . . | 4.5 | 0 42 14.99 | +3.108 | + 6 54 36.4 | +19.71 |
| 7 | ε PISCIUM . . | 4 | 0 56 30.53 | 3.109 | 7 13 19.9 | 19.47 |
| 8 | ζ Piscium (*pr.*) . | 5.4 | 1 7 15.22 | 3.131 | 6 55 9.1 | 19.14 |
| 9 | η PISCIUM . . | 4.3 | 1 24 50.92 | 3.200 | 14 42 22.5 | 18.71 |
| 10 | 101 Piscium . . | 6.7 | 1 29 8.75 | 3.199 | 14 1 38.6 | 18.58 |
| 11 | π Piscium . . | 6 | 1 30 31.63 | +3.174 | +11 30 25.8 | +18.59 |
| 12 | 105 Piscium . . | 6 | 1 32 59.51 | 3.225 | 15 46 34.4 | 18.42 |
| 13 | 4 Arietis . . . | 6 | 1 41 27.51 | 3.244 | 16 20 20.6 | 18.16 |
| 14 | B. A. C. 632 . | 6.7 | 1 56 55.01 | 3.286 | 17 39 29.0 | 17.54 |
| 15 | η Arietis . . . | 5.6 | 2 5 51.63 | 3.345 | 20 37 38.1 | 17.10 |
| 16 | θ Arietis . . . | 6.5 | 2 11 13.90 | +3.329 | +19 19 36.7 | +16.88 |
| 17 | ν Arietis . . . | 6.5 | 2 31 46.69 | 3.396 | 21 25 25.9 | 15.78 |
| 18 | μ Arietis . . . | 6.5 | 2 35 22.60 | 3.372 | 19 28 56.0 | 15.61 |
| 19 | π Arietis . . . | 6.5 | 2 42 22.49 | 3.339 | 16 56 52.7 | 15.27 |
| 20 | ρ Arietis . . . | 6 | 2 49 26.34 | 3.378 | 17 31 39.6 | 14.66 |
| 21 | ε Arietis . . . | 4.5 | 2 52 7.51 | +3.422 | +20 50 35.5 | +14.66 |
| 22 | δ Arietis . . . | 4.5 | 3 4 32.48 | 3.422 | 19 15 23.0 | 13.91 |
| 23 | ζ ARIETIS . . | 4.5 | 3 7 46.58 | 3.438 | 20 35 1.8 | 13.63 |
| 24 | τ Arietis . . . | 5 | 3 14 4.16 | 3.453 | 20 41 55.2 | 13.24 |
| 25 | 17 Tauri . . . | 4 | 3 37 30.98 | 3.552 | 23 43 20.0 | 11.65 |
| 26 | η TAURI . . . | 3 | 3 40 6.92 | +3.555 | +23 43 12.4 | +11.44 |
| 27 | 27 Tauri . . . | 4 | 3 41 47.46 | 3.556 | 23 40 21.6 | 11.33 |
| 28 | A Tauri . . . | 5.4 | 3 57 21.95 | 3.538 | 21 44 28.4 | 10.16 |
| 29 | *p* Tauri . . . | 6 | 4 3 17.19 | 3.647 | 26 9 23.5 | 9.78 |
| 30 | φ Tauri . . . | 5.6 | 4 12 43.70 | 3.677 | 27 3 11.5 | 9.01 |
| 31 | χ Tauri . . . | 6.5 | 4 15 2.35 | +3.644 | +25 20 4.0 | + 8.83 |
| 32 | κ Tauri . . . | 5.4 | 4 17 58.45 | 3.562 | 22 0 31.0 | 8.59 |
| 33 | B. A. C. 1408 . | 6 | 4 26 52.97 | 3.754 | 28 41 58.1 | 7.85 |
| 34 | B. A. C. 1444 . | 6 | 4 33 34.27 | 3.749 | 28 22 22.5 | 7.35 |
| 35 | τ Tauri . . . | 4.5 | 4 34 48.27 | 3.595 | 22 43 2.7 | 7.28 |
| 36 | B. A. C. 1648 . | 6.7 | 5 13 12.27 | +3.763 | +27 49 44.5 | + 4.02 |
| 37 | β TAURI . . . | 2 | 5 18 27.24 | 3.788 | 28 30 2.2 | 3.44 |
| 38 | 26 Aurigæ . . | 6 | 5 30 40.34 | 3.847 | 30 24 59.9 | 2.55 |
| 39 | 136 Tauri . . . | 5 | 5 45 32.09 | 3.772 | 27 34 48.7 | 1.21 |
| 40 | 139 Tauri . . . | 5.6 | 5 50 18.21 | 3.725 | 25 56 11.2 | 0.85 |
| 41 | 1 Geminorum . | 5 | 5 56 35.00 | +3.648 | +23 16 4.2 | + 0.20 |
| 42 | κ Aurigæ . . | 5.4 | 6 7 28.67 | 3.828 | 29 32 28.5 | − 0.94 |
| 43 | μ GEMINORUM . | 3 | 6 15 27.56 | 3.633 | 22 34 31.3 | 1.46 |
| 44 | 49 Aurigæ . . | 6.5 | 6 27 23.55 | +3.783 | +28 7 0.6 | − 2.41 |

NOTE.—The names of those stars whose apparent places are given in the Ephemeris of the Fixed Stars, pp. 275—323, are printed in SMALL CAPITALS.

## MEAN PLACES FOR 1876.0.

| No. | Name. | Magnitude. | Right Ascension. | Annual Variation. | Declination. | Annual Variation. |
|---|---|---|---|---|---|---|
| | | | h m s | s | ° ′ ″ | ″ |
| 45 | 54 Aurigæ | 6 | 6 31 43.91 | +3.787 | +28 22 13.1 | − 2.81 |
| 46 | ε Geminorum | 3.4 | 6 36 18.31 | 3.699 | 25 15 6.2 | 3.18 |
| 47 | ζ Geminorum | 4 | 6 56 45.29 | 3.565 | 20 45 1.3 | 4.93 |
| 48 | τ Geminorum | 5.4 | 7 3 14.77 | 3.828 | 30 26 45.9 | 5.53 |
| 49 | 53 Geminorum | 6.7 | 7 8 12.50 | 3.755 | 28 6 40.3 | 5.88 |
| | | | | | | |
| 50 | ι Geminorum | 4 | 7 18 1.55 | +3.739 | +28 2 32.9 | − 6.78 |
| 51 | $b^2$ Geminorum | 5 | 7 22 6.09 | 3.744 | 28 10 13.4 | 7.04 |
| 52 | υ Geminorum | 4.5 | 7 28 16.96 | 3.711 | 27 10 10.6 | 7.62 |
| 53 | κ Geminorum | 4.3 | 7 36 57.58 | 3.631 | 24 41 36.7 | 8.28 |
| 54 | β GEMINORUM | 1.2 | 7 37 43.59 | 3.682 | 28 19 26.7 | 8.34 |
| | | | | | | |
| 55 | φ GEMINORUM | 5 | 7 45 54.46 | +3.684 | +27 5 6.1 | − 8.96 |
| 56 | μ Cancri | 6.5 | 8 0 28.01 | 3.542 | 21 56 31.4 | 10.09 |
| 57 | $\psi^2$ Cancri | 6 | 8 2 58.99 | 3.626 | 25 52 57.3 | 10.58 |
| 58 | λ Cancri | 6 | 8 13 8.93 | 3.578 | 21 8 19.1 | 11.04 |
| 59 | $\upsilon^2$ Cancri | 6.7 | 8 21 15.58 | 3.569 | 24 33 16.1 | 11.68 |
| | | | | | | |
| 60 | η Cancri | 6 | 8 25 32.24 | +3.482 | +20 51 37.0 | −11.92 |
| 61 | γ Cancri | 4.5 | 8 36 6.52 | 3.484 | 21 54 48.9 | 12.60 |
| 62 | δ Cancri | 4 | 8 37 38.26 | 3.421 | 18 36 31.1 | 12.97 |
| 63 | ξ Cancri | 5 | 9 2 13.69 | 3.461 | 22 32 45.0 | 14.30 |
| 64 | B. A. C. 3138 | 6.7 | 9 6 32.27 | 3.443 | 21 47 38.4 | 14.59 |
| | | | | | | |
| 65 | π Cancri | 6 | 9 8 23.03 | +3.321 | +15 27 18.9 | −14.67 |
| 66 | 83 Cancri | 6 | 9 12 3.46 | 3.357 | 18 13 45.9 | 15.06 |
| 67 | 8 Leonis | 6 | 9 30 11.97 | 3.319 | 16 59 42.2 | 15.84 |
| 68 | ν Leonis | 5 | 9 51 33.09 | 3.237 | 13 2 7.9 | 16.99 |
| 69 | η Leonis | 3.4 | 10 0 34.21 | 3.281 | 17 21 59.6 | 17.38 |
| | | | | | | |
| 70 | α LEONIS | 1.2 | 10 1 46.05 | +3.203 | +12 34 22.0 | −17.42 |
| 71 | 37 Leonis | 6.7 | 10 10 1.44 | 3.232 | 14 20 44.0 | 17.83 |
| 72 | 44 Leonis | 6 | 10 18 42.87 | 3.159 | 9 24 49.4 | 18.25 |
| 73 | ρ LEONIS | 4 | 10 26 16.92 | 3.166 | 9 56 39.0 | 18.40 |
| 74 | l LEONIS | 5 | 10 42 44.29 | 3.159 | 11 12 4.0 | 18.93 |
| | | | | | | |
| 75 | d Leonis | 5 | 10 54 9.39 | +3.102 | + 4 16 57.0 | −19.28 |
| 76 | χ Leonis | 5 | 10 58 37.26 | 3.101 | 8 0 19.5 | 19.42 |
| 77 | $p^5$ Leonis | 5 | 11 7 25.24 | 3.085 | 0 36 16.4 | 19.58 |
| 78 | σ Leonis | 4 | 11 14 44.53 | 3.097 | 6 42 30.3 | 19.68 |
| 79 | τ LEONIS | 5 | 11 21 33.64 | 3.088 | 3 32 20.7 | 19.78 |
| | | | | | | |
| 80 | 89 Leonis | 6 | 11 28 1.30 | +3.075 | + 3 44 55.1 | −19.99 |
| 81 | υ LEONIS | 5.4 | 11 30 36.04 | 3.072 | − 0 8 20.7 | 19.84 |
| 82 | β Virginis | 3.4 | 11 44 14.22 | 3.127 | + 2 27 47.5 | 20.29 |
| 83 | 10 Virginis | 6 | 12 3 20.03 | 3.074 | 2 35 37.2 | 20.28 |
| 84 | η VIRGINIS | 3.4 | 12 13 33.75 | 3.069 | + 0 1 21.6 | 20.03 |
| | | | | | | |
| 85 | B. A. C. 4200 | 6.7 | 12 21 29.33 | +3.063 | − 3 55 43.0 | −20.00 |
| 86 | f Virginis | 6 | 12 30 24.28 | 3.086 | 5 8 59.3 | 19.97 |
| 87 | χ Virginis | 5 | 12 32 51.20 | 3.095 | 7 18 44.9 | 19.89 |
| 88 | ψ Virginis | 5 | 12 47 54.45 | +3.118 | − 8 51 54.2 | −19.64 |

## MEAN PLACES FOR 1876.0.

| No. | Name. | Magnitude. | Right Ascension. | Annual Variation. | Declination. | Annual Variation. |
|---|---|---|---|---|---|---|
| | | | h m s | s | ° ′ ″ | ″ |
| 89 | 49 Virginis . . | 6 | 13 1 24.19 | +3.139 | −10 4 37.7 | −19.37 |
| 90 | θ VIRGINIS . . | 4.5 | 13 3 31.88 | 3.101 | 4 52 34.5 | 19.31 |
| 91 | α VIRGINIS . . | 1 | 13 18 39.75 | 3.153 | 10 30 47.5 | 18.90 |
| 92 | h Virginis . . | 5 | 13 26 26.34 | 3.153 | 9 31 31.8 | 18.69 |
| 93 | 83 Virginis . . | 6 | 13 37 48.64 | 3.228 | 15 33 15.3 | 18.32 |
| 94 | 89 Virginis . . | 5 | 13 43 8.19 | +3.250 | −17 30 57.2 | −18.11 |
| 95 | B. A. C. 4679 . | 6.7 | 13 57 44.55 | 3.242 | 14 22 27.2 | 17.50 |
| 96 | B. A. C. 4700 . | 6 | 14 4 4.01 | 3.259 | 15 42 57.8 | 17.25 |
| 97 | B. A. C. 4722 . | 6 | 14 8 34.68 | 3.305 | 17 37 14.9 | 17.00 |
| 98 | λ Virginis . . | 5.4 | 14 12 24.21 | 3.240 | 12 47 58.0 | 16.77 |
| 99 | 5 Libræ . . . | 6.7 | 14 39 7.68 | +3.300 | −14 56 10.4 | −15.44 |
| 100 | $\alpha^2$ LIBRÆ . . . | 2.3 | 14 44 1.24 | 3.307 | 15 31 29.7 | 15.19 |
| 101 | γ Scorpii . . | 3.4 | 14 56 49.06 | 3.501 | 24 47 35.3 | 14.41 |
| 102 | ι Libræ . . . | 5.4 | 15 5 9.64 | 3.411 | 19 19 15.0 | 13.88 |
| 103 | B. A. C. 5023 . | 6.7 | 15 9 11.64 | 3.457 | 21 56 23.3 | 13.70 |
| 104 | 39 Libræ . . . | 4.5 | 15 29 29.96 | +3.626 | −27 43 21.2 | −12.24 |
| 105 | 42 Libræ . . . | 6.7 | 15 32 57.22 | 3.535 | 23 24 46.8 | 12.01 |
| 106 | A Scorpii . . . | 5 | 15 46 10.33 | 3.591 | 24 57 18.7 | 11.08 |
| 107 | π Scorpii . . . | 3 | 15 51 21.18 | 3.619 | 25 45 19.8 | 10.74 |
| 108 | δ SCORPII . . | 2.3 | 15 53 0.21 | 3.537 | 22 15 59.2 | 10.55 |
| 109 | $c^1$ Scorpii . . . | 5 | 16 4 40.44 | +3.693 | −27 36 8.3 | − 9.68 |
| 110 | σ Scorpii . . . | 3.4 | 16 13 39.24 | 3.638 | 25 17 35.0 | 8.98 |
| 111 | 5 Ophiuchi. . . | 5 | 16 18 9.18 | 3.589 | 23 9 29.9 | 8.60 |
| 112 | α SCORPII . . | 1.2 | 16 21 48.42 | 3.669 | 26 9 16.9 | 8.35 |
| 113 | τ Scorpii . . . | 3.4 | 16 28 10.06 | 3.729 | 27 57 23.1 | 7.81 |
| 114 | B. A. C. 5603 . | 6.7 | 16 37 14.82 | +3.737 | −28 16 34.7 | − 7.09 |
| 115 | 36 Ophiuchi . . | 5 | 17 7 43.65 | 3.685 | 26 25 2.8 | 5.68 |
| 116 | θ Ophiuchi . . | 3.4 | 17 14 23.77 | 3.682 | 24 52 25.5 | 4.02 |
| 117 | d Ophiuchi . . | 5 | 17 19 26.09 | 3.821 | 29 45 11.7 | 3.73 |
| 118 | 3 Sagittarii . . | 5 | 17 39 45.06 | 3.768 | 27 46 52.4 | 1.77 |
| 119 | B. A. C. 6072 . | 6.7 | 17 50 46.77 | +3.803 | −28 44 20.6 | − 0.81 |
| 120 | 9 Sagittarii . . | 5.4 | 17 56 16.17 | 3.676 | 24 21 39.9 | 0.34 |
| 121 | $\gamma^2$ SAGITTARII . | 3.4 | 17 57 50.58 | 3.852 | 30 25 24.1 | 0.41 |
| 122 | B. A. C. 6127 . | 6.7 | 18 0 13.64 | 3.795 | 28 28 7.0 | − 0.09 |
| 123 | B. A. C. 6190 . | 6.7 | 18 9 31.72 | 3.802 | 28 41 25.0 | + 0.83 |
| 124 | δ Sagittarii . . | 3.4 | 18 13 3.31 | +3.841 | −29 52 44.2 | + 1.08 |
| 125 | λ Sagittarii . . | 3 | 18 20 19.12 | 3.706 | 25 29 18.8 | 1.55 |
| 126 | φ Sagittarii . . | 4.3 | 18 37 54.66 | 3.757 | 27 6 59.6 | 3.27 |
| 127 | σ SAGITTARII . | 2.3 | 18 47 34.56 | 3.723 | 26 26 53.8 | 4.07 |
| 128 | τ Sagittarii . . | 4.3 | 18 59 11.87 | 3.753 | 27 50 57.0 | 4.89 |
| 129 | ψ Sagittarii . . | 6 | 19 7 56.27 | +3.685 | −25 28 2.8 | + 5.87 |
| 130 | B. A. C. 6628 . | 6.7 | 19 16 46.53 | 3.750 | 28 6 9.7 | 6.60 |
| 131 | B. A. C. 6666 . | 6.7 | 19 22 11.46 | 3.709 | 27 14 18.9 | 6.91 |
| 132 | h Sagittarii . . | 5.4 | 19 29 9.58 | +3.660 | −25 9 24.8 | + 7.60 |

## MEAN PLACES FOR 1876.0.

| No. | Name. | Magnitude. | Right Ascension. | Annual Variation. | Declination. | Annual Variation. |
|---|---|---|---|---|---|---|
| | | | h m s | s | ° ′ ″ | ″ |
| 133 | ω Sagittarii . . | 5 | 19 48 14.51 | +3.685 | −26 37 35.6 | + 9.22 |
| 134 | A Sagittarii . . | 5 | 19 51 23.65 | 3.663 | 26 31 45.9 | 9.41 |
| 135 | 4 Capricorni . | 6.7 | 20 10 44.30 | 3.535 | 22 11 28.0 | 10.78 |
| 136 | σ Capricorni . | 6.5 | 20 12 14.32 | 3.474 | 19 30 25.0 | 10.97 |
| 137 | B. A. C. 7049 . | 6.7 | 20 22 14.58 | 3.527 | 22 48 2.2 | 11.62 |
| 138 | ψ Capricorni . | 4.5 | 20 38 45.07 | +3.565 | −25 42 54.3 | +12.65 |
| 139 | B. A. C. 7237 . | 6.7 | 20 45 44.78 | 3.533 | 24 14 47.9 | 13.16 |
| 140 | η Capricorni . | 5.6 | 20 57 20.72 | 3.426 | 20 20 38.1 | 13.99 |
| 141 | θ Capricorni . | 4 | 20 58 58.55 | 3.383 | 17 43 24.8 | 14.09 |
| 142 | φ Capricorni . | 5.6 | 21 8 34.35 | 3.424 | 21 9 49.6 | 14.77 |
| 143 | ι Capricorni . | 4.5 | 21 15 20.69 | +3.353 | −17 21 37.3 | +15.15 |
| 144 | ε Capricorni . | 5.4 | 21 30 8.14 | 3.371 | 20 1 13.1 | 15.94 |
| 145 | γ Capricorni . | 4.3 | 21 33 13.21 | 3.337 | 17 13 15.7 | 16.09 |
| 146 | δ Capricorni . | 3 | 21 40 11.65 | 3.319 | 16 41 18.5 | 16.19 |
| 147 | μ CAPRICORNI . | 5 | 21 46 32.05 | 3.279 | 14 8 2.3 | 16.78 |
| 148 | ι Aquarii . . | 4 | 21 59 44.01 | +3.249 | −14 28 13.0 | +17.31 |
| 149 | 42 Aquarii . . | 6 | 22 10 9.43 | 3.218 | 13 26 52.1 | 17.83 |
| 150 | 50 Aquarii . . | 6.7 | 22 17 48.39 | 3.220 | 14 9 24.8 | 18.13 |
| 151 | σ Aquarii . . | 5.4 | 22 24 4.96 | 3.181 | 11 18 39.3 | 18.41 |
| 152 | 67 Aquarii . . | 6 | 22 36 45.58 | 3.134 | 7 36 37.1 | 18.79 |
| 153 | λ AQUARII . . | 4 | 22 46 8.61 | +3.131 | − 8 14 19.0 | +19.07 |
| 154 | 81 Aquarii . . | 6.7 | 22 54 57.07 | 3.123 | 7 43 29.1 | 19.31 |
| 155 | φ Aquarii . . | 4.5 | 23 7 54.08 | 3.112 | 6 43 0.8 | 19.38 |
| 156 | 96 Aquarii . . | 6.5 | 23 12 58.19 | 3.115 | − 5 48 4.4 | 19.66 |
| 157 | κ Piscium . . | 5.4 | 23 20 34.66 | 3.078 | + 0 34 37.1 | 19.66 |
| 158 | 14 Piscium . . | 6 | 23 27 46.41 | +3.084 | − 1 55 55.1 | +19.87 |
| 159 | λ Piscium . . | 5 | 23 35 43.22 | 3.064 | + 1 5 52.5 | 19.81 |
| 160 | 21 Piscium . . | 6 | 23 43 6.65 | 3.073 | 0 23 9.8 | 19.92 |
| 161 | 25 Piscium . . | 6 | 23 46 43.63 | 3.070 | + 1 24 7.2 | 20.04 |
| 162 | B. A. C. 8365 . | 6.7 | 23 58 42.47 | +3.076 | − 1 11 30.5 | +19.97 |

## FOR WASHINGTON MEAN NOON AND MIDNIGHT.

| Day of Month. | JANUARY. | | | FEBRUARY. | | | MARCH. | | |
|---|---|---|---|---|---|---|---|---|---|
| | Semi-diameter. | Horizontal Parallax. | Hourly Diff. | Semi-diameter. | Horizontal Parallax. | Hourly Diff. | Semi-diameter. | Horizontal Parallax. | Hourly Diff. |
| d | ′ ″ | ′ ″ | ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ′ ″ | ″ |
| 1.0 | 15 15.2 | 55 52.0 | +1.44 | 15 49.6 | 57 58.5 | +1.42 | 16 2.7 | 58 46.5 | +0.75 |
| 1.5 | 15 20.0 | 56 9.9 | 1.55 | 15 54.3 | 58 15.7 | 1.44 | 16 5.0 | 58 55.0 | 0.68 |
| 2.0 | 15 25.3 | 56 29.2 | 1.66 | 15 58.9 | 58 32.8 | 1.42 | 16 7.1 | 59 2.7 | 0.60 |
| 2.5 | 15 30.9 | 56 49.8 | 1.76 | 16 3.6 | 58 49.8 | 1.39 | 16 8.9 | 59 9.4 | 0.52 |
| 3.0 | 15 36.8 | 57 11.6 | 1.86 | 16 8.0 | 59 6.2 | 1.34 | 16 10.5 | 59 15.1 | 0.43 |
| 3.5 | 15 43.0 | 57 34.4 | 1.94 | 16 12.3 | 59 21.9 | 1.26 | 16 11.7 | 59 19.7 | 0.33 |
| 4.0 | 15 49.4 | 57 58.0 | 2.00 | 16 16.2 | 59 36.3 | 1.15 | 16 12.6 | 59 22.9 | 0.22 |
| 4.5 | 15 56.1 | 58 22.3 | 2.04 | 16 19.8 | 59 49.3 | 1.01 | 16 13.1 | 59 24.8 | +0.10 |
| 5.0 | 16 2.8 | 58 46.8 | 2.03 | 16 22.8 | 60 0.3 | 0.82 | 16 13.2 | 59 25.3 | −0.04 |
| 5.5 | 16 9.3 | 59 11.0 | 2.00 | 16 25.2 | 60 9.0 | 0.61 | 16 12.9 | 59 23.9 | 0.19 |
| 6.0 | 16 15.7 | 59 34.5 | 1.91 | 16 26.8 | 60 14.9 | 0.37 | 16 12.0 | 59 20.7 | 0.35 |
| 6.5 | 16 21.8 | 59 56.7 | 1.77 | 16 27.5 | 60 17.7 | +0.10 | 16 10.5 | 59 15.4 | 0.53 |
| 7.0 | 16 27.2 | 60 16.8 | 1.58 | 16 27.4 | 60 17.2 | −0.19 | 16 8.5 | 59 8.0 | 0.70 |
| 7.5 | 16 32.1 | 60 34.4 | 1.34 | 16 26.3 | 60 13.2 | 0.49 | 16 6.0 | 58 58.5 | 0.88 |
| 8.0 | 16 36.0 | 60 48.7 | 1.05 | 16 24.2 | 60 5.6 | 0.78 | 16 2.8 | 58 46.9 | 1.05 |
| 8.5 | 16 38.9 | 60 59.3 | 0.71 | 16 21.2 | 59 54.5 | 1.07 | 15 59.0 | 58 33.2 | 1.22 |
| 9.0 | 16 40.5 | 61 5.6 | +0.35 | 16 17.2 | 59 40.0 | 1.33 | 15 54.9 | 58 17.8 | 1.36 |
| 9.5 | 16 41.0 | 61 7.4 | −0.04 | 16 15.2 | 59 32.6 | 1.56 | 15 50.2 | 58 0.7 | 1.48 |
| 10.0 | 16 40.3 | 61 4.6 | 0.43 | 16 7.0 | 59 2.6 | 1.76 | 15 45.2 | 57 42.3 | 1.59 |
| 10.5 | 16 38.2 | 60 57.0 | 0.82 | 16 1.0 | 58 40.4 | 1.92 | 15 39.9 | 57 22.7 | 1.66 |
| 11.0 | 16 35.0 | 60 45.0 | 1.19 | 15 54.5 | 58 16.7 | 2.03 | 15 34.3 | 57 2.5 | 1.70 |
| 11.5 | 16 30.5 | 60 28.7 | 1.52 | 15 47.8 | 57 51.9 | 2.10 | 15 28.8 | 56 42.1 | 1.70 |
| 12.0 | 16 25.0 | 60 8.7 | 1.80 | 15 40.9 | 57 26.5 | 2.12 | 15 23.3 | 56 21.8 | 1.68 |
| 12.5 | 16 18.8 | 59 45.6 | 2.04 | 15 34.0 | 57 1.2 | 2.10 | 15 17.9 | 56 1.9 | 1.63 |
| 13.0 | 16 11.8 | 59 19.9 | 2.22 | 15 24.5 | 56 36.4 | 2.03 | 15 12.6 | 55 42.7 | 1.55 |
| 13.5 | 16 4.3 | 58 52.5 | 2.34 | 15 20.8 | 56 12.7 | 1.93 | 15 7.8 | 55 24.8 | 1.44 |
| 14.0 | 15 56.5 | 58 24.0 | 2.40 | 15 14.7 | 55 50.3 | 1.80 | 15 3.3 | 55 8.4 | 1.30 |
| 14.5 | 15 48.6 | 57 55.1 | 2.41 | 15 9.1 | 55 29.7 | 1.64 | 14 59.3 | 54 53.8 | 1.14 |
| 15.0 | 15 40.9 | 57 56.4 | 2.36 | 15 4.0 | 55 11.0 | 1.46 | 14 55.9 | 54 41.2 | 0.96 |
| 15.5 | 15 33.2 | 56 58.4 | 2.29 | 14 59.6 | 54 54.7 | 1.26 | 14 53.1 | 54 30.8 | 0.77 |
| 16.0 | 15 26.0 | 56 31.6 | 2.16 | 14 55.8 | 54 40.7 | 1.06 | 14 50.9 | 54 22.8 | 0.57 |
| 16.5 | 15 19.1 | 56 6.6 | 2.01 | 14 52.7 | 54 29.3 | 0.85 | 14 49.4 | 54 17.2 | 0.36 |
| 17.0 | 15 12.8 | 55 43.5 | 1.84 | 14 50.2 | 54 20.4 | 0.63 | 14 48.6 | 54 14.3 | −0.14 |
| 17.5 | 15 7.1 | 55 22.5 | 1.66 | 14 48.5 | 54 14.2 | 0.41 | 14 48.5 | 54 14.0 | +0.09 |
| 18.0 | 15 2.0 | 55 3.8 | 1.46 | 14 47.6 | 54 10.6 | −0.19 | 14 49.1 | 54 16.3 | 0.31 |
| 18.5 | 14 57.6 | 54 47.6 | 1.25 | 14 47.3 | 54 9.6 | +0.03 | 14 50.5 | 54 21.3 | 0.52 |
| 19.0 | 14 53.9 | 54 33.9 | 1.04 | 14 47.7 | 54 11.1 | 0.22 | 14 52.5 | 54 28.8 | 0.73 |
| 19.5 | 14 50.9 | 54 22.7 | 0.83 | 14 48.7 | 54 14.9 | 0.41 | 14 52.5 | 54 28.7 | 0.92 |
| 20.0 | 14 48.5 | 54 13.9 | 0.63 | 14 50.4 | 54 21.0 | 0.60 | 14 58.5 | 54 50.9 | 1.10 |
| 20.5 | 14 46.8 | 54 7.6 | 0.43 | 14 52.6 | 54 29.2 | 0.76 | 15 2.4 | 55 5.2 | 1.28 |
| 21.0 | 14 45.6 | 54 3.6 | 0.23 | 14 55.4 | 54 39.2 | 0.91 | 15 6.9 | 55 21.4 | 1.42 |
| 21.5 | 14 45.2 | 54 1.9 | −0.05 | 14 58.5 | 54 50.8 | 1.03 | 15 11.7 | 55 39.2 | 1.54 |
| 22.0 | 14 45.3 | 54 2.3 | +0.11 | 15 2.0 | 55 3.8 | 1.13 | 15 16.9 | 55 58.2 | 1.63 |
| 22.5 | 14 45.9 | 54 4.5 | 0.26 | 15 5.9 | 55 18.0 | 1.12 | 15 22.3 | 56 18.1 | 1.69 |
| 23.0 | 14 47.0 | 54 8.5 | 0.40 | 15 10.0 | 55 33.0 | 1.29 | 15 27.9 | 56 38.6 | 1.73 |
| 23.5 | 14 48.5 | 54 14.1 | 0.53 | 15 14.2 | 55 48.7 | 1.33 | 15 33.5 | 56 59.4 | 1.73 |
| 24.0 | 14 50.5 | 54 21.2 | 0.64 | 15 18.6 | 56 4.8 | 1.35 | 15 39.1 | 57 19.9 | 1.69 |
| 24.5 | 14 52.7 | 54 29.5 | 0.74 | 15 23.0 | 56 21.0 | 1.35 | 15 44.5 | 57 39.8 | 1.62 |
| 25.0 | 14 55.3 | 54 39.0 | 0.83 | 15 27.5 | 56 37.2 | 1.34 | 15 49.6 | 57 58.7 | 1.53 |
| 25.5 | 14 58.2 | 54 49.4 | 0.91 | 15 31.8 | 56 53.1 | 1.31 | 15 54.5 | 58 16.4 | 1.41 |
| 26.0 | 15 1.2 | 55 0.7 | 0.97 | 15 36.0 | 57 8.6 | 1.27 | 15 58.9 | 58 32.5 | 1.26 |
| 26.5 | 15 4.5 | 55 12.7 | 1.03 | 15 40.0 | 57 23.5 | 1.22 | 16 2.7 | 58 46.6 | 1.10 |
| 27.0 | 15 7.9 | 55 25.4 | 1.09 | 15 43.9 | 57 37.8 | 1.16 | 16 6.0 | 58 58.7 | 0.92 |
| 27.5 | 15 11.5 | 55 38.8 | 1.13 | 15 47.6 | 57 51.2 | 1.09 | 16 8.7 | 59 8.7 | 0.74 |
| 28.0 | 15 15.3 | 55 52.6 | 1.17 | 15 51.1 | 58 4.0 | 1.03 | 16 10.9 | 59 16.6 | 0.57 |
| 28.5 | 15 19.2 | 56 6.9 | 1.21 | 15 54.3 | 58 15.9 | 0.96 | 16 12.4 | 59 22.3 | 0.39 |
| 29.0 | 15 23.2 | 56 21.5 | 1.25 | 15 57.3 | 58 26.9 | 0.89 | 16 13.4 | 59 26.0 | 0.22 |
| 29.5 | 15 27.4 | 56 36.8 | 1.29 | 16 0.1 | 58 37.1 | 0.82 | 16 13.9 | 59 27.6 | +0.06 |
| 30.0 | 15 31.6 | 56 52.5 | 1.32 | 16 2.7 | 58 46.5 | +0.75 | 16 13.8 | 59 27.4 | −0.09 |
| 30.5 | 15 36.0 | 57 8.5 | 1.35 | | | | 16 13.3 | 59 25.5 | 0.22 |
| 31.0 | 15 40.4 | 57 24.9 | 1.38 | | $\Delta s = .272\,\pi$ | | 16 12.4 | 59 22.2 | 0.34 |
| 31.5 | 15 45.0 | 57 41.6 | +1.40 | | | | 16 11.1 | 59 17.4 | −0.45 |

## FOR WASHINGTON MEAN NOON AND MIDNIGHT.

| Day of Month. | APRIL. | | | MAY. | | | JUNE. | | |
|---|---|---|---|---|---|---|---|---|---|
| | Semi-diameter. | Horizontal Parallax. | Hourly Diff. | Semi-diameter. | Horizontal Parallax. | Hourly Diff. | Semi-diameter. | Horizontal Parallax. | Hourly Diff. |
| d | ′ ″ | ′ ″ | ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ′ ″ | ″ |
| 1.0 | 16 9.5 | 59 11.5 | −0.54 | 15 55.5 | 58 20.1 | −1.44 | 15 21.0 | 56 13.4 | −1.56 |
| 1.5 | 16 7.6 | 59 4.6 | 0.62 | 15 50.8 | 58 2.9 | 1.44 | 15 16.1 | 55 55.4 | 1.44 |
| 2.0 | 16 5.4 | 58 56.7 | 0.69 | 15 46.1 | 57 45.7 | 1.43 | 15 11.5 | 55 38.8 | 1.33 |
| 2.5 | 16 3.0 | 58 47.9 | 0.77 | 15 41.4 | 57 28.6 | 1.41 | 15 7.4 | 55 23.5 | 1.22 |
| 3.0 | 15 0.4 | 58 38.3 | 0.84 | 15 36.9 | 57 11.9 | 1.39 | 15 3.6 | 55 9.6 | 1.11 |
| 3.5 | 15 57.6 | 58 27.8 | 0.91 | 15 32.4 | 56 55.4 | 1.35 | 15 0.2 | 54 56.9 | 1.01 |
| 4.0 | 15 54.5 | 58 16.5 | 0.97 | 15 28.0 | 56 39.4 | 1.31 | 14 57.1 | 54 45.5 | 0.90 |
| 4.5 | 15 51.2 | 58 4.4 | 1.04 | 15 23.9 | 56 23.9 | 1.27 | 14 54.3 | 54 35.3 | 0.79 |
| 5.0 | 15 47.7 | 57 51.6 | 1.10 | 15 19.7 | 56 8.9 | 1.23 | 14 51.9 | 54 26.4 | 0.69 |
| 5.5 | 15 44.0 | 57 38.1 | 1.16 | 15 15.8 | 55 54.3 | 1.19 | 14 49.7 | 54 18.6 | 0.59 |
| 6.0 | 15 40.2 | 57 23.9 | 1.21 | 15 12.0 | 55 40.4 | 1.14 | 14 48.0 | 54 12.2 | 0.49 |
| 6.5 | 15 36.1 | 57 9.0 | 1.26 | 15 8.4 | 55 27.0 | 1.09 | 14 46.6 | 54 6.9 | 0.38 |
| 7.0 | 15 32.0 | 56 53.7 | 1.30 | 15 4.9 | 55 14.2 | 1.04 | 14 45.5 | 54 2.9 | 0.28 |
| 7.5 | 15 27.7 | 56 38.0 | 1.32 | 15 1.6 | 55 2.1 | 0.97 | 14 44.8 | 54 0.3 | 0.17 |
| 8.0 | 15 23.3 | 56 22.1 | 1.33 | 14 58.5 | 54 50.8 | 0.90 | 14 44.4 | 53 58.9 | −0.05 |
| 8.5 | 15 19.0 | 56 6.1 | 1.33 | 14 55.7 | 54 40.5 | 0.83 | 14 44.4 | 53 59.0 | +0.07 |
| 9.0 | 15 14.7 | 55 50.2 | 1.31 | 14 53.2 | 54 31.1 | 0.73 | 14 44.9 | 54 0.7 | 0.21 |
| 9.5 | 15 10.5 | 55 34.8 | 1.26 | 14 51.0 | 54 23.0 | 0.63 | 14 45.8 | 54 4.1 | 0.35 |
| 10.0 | 15 6.4 | 55 19.9 | 1.21 | 14 49.0 | 54 16.1 | 0.52 | 14 47.2 | 54 9.2 | 0.51 |
| 10.5 | 15 2.6 | 55 5.9 | 1.13 | 14 47.6 | 54 10.6 | 0.39 | 14 49.1 | 54 16.2 | 0.66 |
| 11.0 | 14 59.1 | 54 53.0 | 1.02 | 14 46.5 | 54 6.8 | 0.25 | 14 51.5 | 54 25.2 | 0.83 |
| 11.5 | 14 56.0 | 54 41.4 | 0.90 | 14 46.0 | 54 4.8 | −0.09 | 14 54.5 | 54 36.2 | 1.00 |
| 12.0 | 14 53.3 | 54 31.5 | 0.76 | 14 46.0 | 54 4.7 | +0.08 | 14 58.1 | 54 49.3 | 1.18 |
| 12.5 | 14 51.0 | 54 23.3 | 0.61 | 14 46.5 | 54 6.7 | 0.25 | 15 2.2 | 55 4.5 | 1.36 |
| 13.0 | 14 49.3 | 54 17.1 | 0.43 | 14 47.6 | 54 10.7 | 0.43 | 15 7.0 | 55 21.9 | 1.54 |
| 13.5 | 14 48.3 | 54 13.2 | 0.24 | 14 49.3 | 54 17.1 | 0.63 | 15 12.3 | 55 41.4 | 1.71 |
| 14.0 | 14 47.8 | 54 11.4 | −0.05 | 14 51.7 | 54 25.9 | 0.73 | 15 18.1 | 56 2.9 | 1.87 |
| 14.5 | 14 48.0 | 54 12.1 | +0.16 | 14 54.8 | 54 37.1 | 1.03 | 15 24.5 | 56 26.3 | 2.02 |
| 15.0 | 14 48.9 | 54 15.3 | 0.37 | 14 58.5 | 54 50.6 | 1.23 | 15 31.3 | 56 51.5 | 2.16 |
| 15.5 | 14 50.2 | 54 21.0 | 0.59 | 15 2.8 | 55 6.5 | 1.43 | 15 38.6 | 57 18.1 | 2.27 |
| 16.0 | 14 52.7 | 54 29.3 | 0.80 | 15 7.8 | 55 24.9 | 1.63 | 15 46.1 | 57 45.8 | 2.35 |
| 16.5 | 14 55.6 | 54 40.2 | 1.02 | 15 12.9 | 55 43.5 | 1.81 | 15 53.9 | 58 14.2 | 2.38 |
| 17.0 | 14 59.3 | 54 53.7 | 1.22 | 15 19.5 | 56 8.1 | 1.97 | 16 1.6 | 58 42.8 | 2.37 |
| 17.5 | 15 3.6 | 55 9.4 | 1.41 | 15 26.2 | 56 32.6 | 2.11 | 16 9.3 | 59 11.0 | 2.32 |
| 18.0 | 15 8.5 | 55 27.4 | 1.59 | 15 33.3 | 56 58.6 | 2.23 | 16 16.8 | 59 38.2 | 2.21 |
| 18.5 | 15 13.9 | 55 47.4 | 1.75 | 15 40.7 | 57 25.8 | 2.30 | 16 23.7 | 60 3.6 | 2.03 |
| 19.0 | 15 19.9 | 56 9.2 | 1.88 | 15 48.3 | 57 53.7 | 2.34 | 16 29.9 | 60 26.5 | 1.78 |
| 19.5 | 15 26.2 | 56 32.5 | 1.99 | 15 55.9 | 58 21.8 | 2.34 | 16 35.3 | 60 46.2 | 1.49 |
| 20.0 | 15 32.9 | 56 56.9 | 2.07 | 16 3.5 | 58 49.5 | 2.27 | 16 39.6 | 61 2.1 | 1.15 |
| 20.5 | 15 39.6 | 57 21.9 | 2.10 | 16 10.7 | 59 16.1 | 2.15 | 16 42.7 | 61 13.6 | 0.77 |
| 21.0 | 15 46.5 | 57 47.0 | 2.09 | 16 17.5 | 59 41.0 | 1.98 | 16 44.6 | 61 20.0 | +0.36 |
| 21.5 | 15 53.2 | 58 11.8 | 2.03 | 16 23.6 | 60 3.5 | 1.76 | 16 45.1 | 61 22.3 | −0.05 |
| 22.0 | 15 59.7 | 58 35.5 | 1.93 | 16 29.0 | 60 23.0 | 1.48 | 16 44.3 | 61 19.2 | 0.47 |
| 22.5 | 16 5.7 | 58 57.8 | 1.78 | 16 33.3 | 60 38.8 | 1.15 | 16 42.1 | 61 11.2 | 0.86 |
| 23.0 | 16 11.3 | 59 18.1 | 1.59 | 16 36.5 | 60 50.6 | 0.80 | 16 38.7 | 60 58.7 | 1.22 |
| 23.5 | 16 16.1 | 59 35.9 | 1.37 | 16 38.5 | 60 58.1 | 0.44 | 16 34.2 | 60 42.1 | 1.54 |
| 24.0 | 16 20.2 | 59 50.8 | 1.12 | 16 39.3 | 61 1.1 | +0.06 | 16 28.7 | 60 21.9 | 1.82 |
| 24.5 | 16 23.4 | 60 2.7 | 0.84 | 16 38.9 | 60 59.6 | −0.31 | 16 22.4 | 59 58.8 | 2.02 |
| 25.0 | 16 25.7 | 60 11.0 | 0.55 | 16 37.3 | 60 53.8 | 0.66 | 16 15.5 | 59 33.6 | 2.17 |
| 25.5 | 16 27.0 | 60 15.9 | +0.26 | 16 34.6 | 60 43.9 | 0.98 | 16 8.2 | 59 6.9 | 2.27 |
| 26.0 | 16 27.4 | 60 17.2 | −0.03 | 16 31.0 | 60 30.4 | 1.26 | 16 0.7 | 58 39.3 | 2.32 |
| 26.5 | 16 26.9 | 60 15.3 | 0.29 | 16 26.5 | 60 13.8 | 1.50 | 15 53.1 | 58 11.5 | 2.31 |
| 27.0 | 16 25.5 | 60 10.3 | 0.54 | 16 21.2 | 59 54.6 | 1.69 | 15 45.6 | 57 44.0 | 2.26 |
| 27.5 | 16 23.4 | 60 2.5 | 0.76 | 16 15.5 | 59 33.5 | 1.83 | 15 38.4 | 57 17.4 | 2.18 |
| 28.0 | 16 20.6 | 59 52.2 | 0.95 | 16 9.3 | 59 10.9 | 1.92 | 15 31.4 | 56 51.8 | 2.07 |
| 28.5 | 16 17.2 | 59 39.8 | 1.11 | 16 3.0 | 58 47.5 | 1.97 | 15 24.9 | 56 27.8 | 1.94 |
| 29.0 | 16 13.4 | 59 25.7 | 1.23 | 15 56.5 | 58 23.8 | 1.98 | 15 18.8 | 56 5.3 | 1.80 |
| 29.5 | 16 9.2 | 59 10.4 | 1.32 | 15 50.0 | 58 0.2 | 1.96 | 15 13.1 | 55 44.6 | 1.65 |
| 30.0 | 16 4.8 | 58 54.2 | 1.38 | 15 43.7 | 57 37.0 | 1.90 | 15 8.0 | 55 25.8 | 1.49 |
| 30.5 | 16 0.2 | 58 37.3 | −1.42 | 15 37.6 | 57 14.6 | 1.83 | 15 3.4 | 55 8.9 | 1.33 |
| 31.0 | Δs = .272 π | | | 15 31.8 | 56 53.1 | 1.75 | 14 59.3 | 54 53.8 | 1.17 |
| 31.5 | | | | 15 26.3 | 56 32.7 | −1.66 | 14 55.8 | 54 40.7 | −1.01 |

## FOR WASHINGTON MEAN NOON AND MIDNIGHT.

| Day of Month. | JULY. | | | AUGUST. | | | SEPTEMBER. | | |
|---|---|---|---|---|---|---|---|---|---|
| | Semi-diameter. | Horizontal Parallax. | Hourly Diff. | Semi-diameter. | Horizontal Parallax. | Hourly Diff. | Semi-diameter. | Horizontal Parallax. | Hourly Diff. |
| d<br>1.0 | 14′ 59″.3 | 54′ 53″.8 | −1″.17 | 14′ 45″.3 | 54′ 2″.1 | −0″.17 | 14′ 55″.7 | 54′ 40″.6 | +0″.85 |
| 1.5 | 14 55.8 | 54 40.7 | 1.01 | 14 45.0 | 54 1.0 | −0.02 | 14 58.7 | 54 51.4 | 0.95 |
| 2.0 | 14 52.7 | 54 29.5 | 0.86 | 14 45.1 | 54 1.7 | +0.12 | 15 1.9 | 55 3.3 | 1.03 |
| 2.5 | 14 50.2 | 54 20.1 | 0.71 | 14 45.8 | 54 4.0 | 0.25 | 15 5.4 | 55 16.0 | 1.09 |
| 3.0 | 14 48.0 | 54 12.4 | 0.57 | 14 46.8 | 54 7.8 | 0.38 | 15 9.0 | 55 29.4 | 1.14 |
| 3.5 | 14 46.5 | 54 6.5 | 0.43 | 14 48.2 | 54 13.0 | 0.49 | 15 12.8 | 55 43.4 | 1.19 |
| 4.0 | 14 45.3 | 54 2.1 | 0.30 | 14 50.0 | 54 19.5 | 0.59 | 15 16.7 | 55 57.8 | 1.21 |
| 4.5 | 14 44.5 | 53 59.2 | 0.18 | 14 52.1 | 54 27.1 | 0.68 | 15 20.7 | 56 12.8 | 1.23 |
| 5.0 | 14 44.0 | 53 57.7 | −0.07 | 14 54.4 | 54 35.8 | 0.77 | 15 24.7 | 56 27.2 | 1.23 |
| 5.5 | 14 44.0 | 53 57.6 | +0.05 | 14 57.1 | 54 45.6 | 0.86 | 15 28.8 | 56 42.0 | 1.24 |
| 6.0 | 14 44.4 | 53 58.9 | 0.16 | 15 0.0 | 54 56.4 | 0.94 | 15 32.9 | 56 56.9 | 1.24 |
| 6.5 | 14 45.1 | 54 1.5 | 0.27 | 15 3.3 | 55 8.2 | 1.02 | 15 36.9 | 57 11.7 | 1.24 |
| 7.0 | 14 46.2 | 54 5.3 | 0.38 | 15 6.7 | 55 20.8 | 1.10 | 15 40.9 | 57 26.5 | 1.23 |
| 7.5 | 14 47.5 | 54 10.5 | 0.49 | 15 10.3 | 55 34.4 | 1.18 | 15 44.9 | 57 41.2 | 1.22 |
| 8.0 | 14 49.3 | 54 16.9 | 0.60 | 15 14.3 | 55 49.0 | 1.25 | 15 48.8 | 57 55.7 | 1.20 |
| 8.5 | 14 51.5 | 54 24.9 | 0.72 | 15 18.6 | 56 4.6 | 1.34 | 15 52.7 | 58 9.8 | 1.17 |
| 9.0 | 14 54.0 | 54 34.3 | 0.85 | 15 23.1 | 56 21.1 | 1.42 | 15 56.5 | 58 23.7 | 1.15 |
| 9.5 | 14 57.0 | 54 45.3 | 0.98 | 15 27.8 | 56 38.6 | 1.49 | 16 0.2 | 58 37.4 | 1.11 |
| 10.0 | 15 0.3 | 54 57.6 | 1.12 | 15 32.8 | 56 56.9 | 1.56 | 16 3.7 | 58 50.4 | 1.06 |
| 10.5 | 15 4.3 | 55 12.1 | 1.25 | 15 38.0 | 57 15.9 | 1.62 | 16 7.1 | 59 2.8 | 1.00 |
| 11.0 | 15 8.6 | 55 27.9 | 1.39 | 15 43.4 | 57 35.6 | 1.67 | 16 10.3 | 59 14.3 | 0.92 |
| 11.5 | 15 13.3 | 55 45.4 | 1.53 | 15 48.9 | 57 55.9 | 1.71 | 16 13.1 | 59 24.8 | 0.83 |
| 12.0 | 15 18.6 | 56 4.5 | 1.66 | 15 54.5 | 58 16.5 | 1.73 | 16 15.6 | 59 34.0 | 0.70 |
| 12.5 | 15 24.2 | 56 25.2 | 1.79 | 16 0.2 | 58 37.3 | 1.73 | 16 17.7 | 59 41.6 | 0.55 |
| 13.0 | 15 30.3 | 56 47.4 | 1.91 | 16 5.7 | 58 57.7 | 1.69 | 16 19.2 | 59 47.2 | 0.38 |
| 13.5 | 15 36.6 | 57 10.9 | 2.01 | 16 11.1 | 59 17.6 | 1.63 | 16 20.2 | 59 50.7 | +0.19 |
| 14.0 | 15 43.3 | 57 35.5 | 2.09 | 16 16.3 | 59 36.6 | 1.52 | 16 20.5 | 59 51.8 | −0.02 |
| 14.5 | 15 50.3 | 58 1.0 | 2.15 | 16 21.0 | 59 53.9 | 1.37 | 16 20.0 | 59 50.2 | 0.25 |
| 15.0 | 15 57.3 | 58 27.0 | 2.18 | 16 25.2 | 60 9.2 | 1.18 | 16 18.9 | 59 45.9 | 0.48 |
| 15.5 | 16 4.4 | 58 53.0 | 2.17 | 16 28.7 | 60 22.1 | 0.95 | 16 16.9 | 59 38.6 | 0.72 |
| 16.0 | 16 11.4 | 59 18.7 | 2.10 | 16 31.4 | 60 31.9 | 0.69 | 16 14.1 | 59 28.5 | 0.96 |
| 16.5 | 16 18.2 | 59 43.4 | 1.99 | 16 33.2 | 60 38.5 | 0.40 | 16 10.6 | 59 15.7 | 1.18 |
| 17.0 | 16 24.4 | 60 6.3 | 1.82 | 16 30.4 | 60 41.3 | +0.07 | 16 6.4 | 59 0.3 | 1.38 |
| 17.5 | 16 30.0 | 60 26.9 | 1.60 | 16 33.6 | 60 40.1 | −0.27 | 16 1.6 | 58 42.7 | 1.56 |
| 18.0 | 16 34.8 | 60 44.5 | 1.33 | 16 32.2 | 60 34.8 | 0.61 | 15 56.3 | 58 23.1 | 1.71 |
| 18.5 | 16 38.6 | 60 58.6 | 1.01 | 16 29.6 | 60 25.6 | 0.93 | 15 50.5 | 58 1.9 | 1.82 |
| 19.0 | 16 41.4 | 61 8.6 | 0.65 | 16 26.1 | 60 12.5 | 1.24 | 15 44.4 | 57 39.6 | 1.89 |
| 19.5 | 16 42.9 | 61 14.1 | +0.26 | 16 21.6 | 59 55.9 | 1.52 | 15 38.3 | 57 16.8 | 1.92 |
| 20.0 | 16 43.1 | 61 14.9 | −0.14 | 16 16.2 | 59 36.2 | 1.77 | 15 32.0 | 56 53.8 | 1.91 |
| 20.5 | 16 42.0 | 61 10.8 | 0.54 | 16 10.1 | 59 13.7 | 1.96 | 15 25.8 | 56 31.0 | 1.87 |
| 21.0 | 16 39.5 | 61 1.9 | 0.93 | 16 3.4 | 58 49.3 | 2.10 | 15 19.8 | 56 9.0 | 1.79 |
| 21.5 | 16 36.0 | 60 48.6 | 1.29 | 15 56.4 | 58 23.5 | 2.20 | 15 14.1 | 55 48.2 | 1.68 |
| 22.0 | 16 31.2 | 60 31.2 | 1.61 | 15 49.1 | 57 56.8 | 2.24 | 15 8.9 | 55 28.8 | 1.54 |
| 22.5 | 16 25.4 | 60 10.1 | 1.88 | 15 41.8 | 57 30.0 | 2.24 | 15 4.0 | 55 11.2 | 1.38 |
| 23.0 | 16 19.0 | 59 46.2 | 2.10 | 15 34.6 | 57 3.4 | 2.19 | 14 59.9 | 54 55.8 | 1.20 |
| 23.5 | 16 11.8 | 59 20.1 | 2.25 | 15 27.6 | 56 37.7 | 2.09 | 14 56.3 | 54 42.5 | 1.00 |
| 24.0 | 16 4.3 | 58 52.4 | 2.35 | 15 21.0 | 56 13.4 | 1.96 | 14 53.3 | 54 31.7 | 0.80 |
| 24.5 | 15 56.5 | 58 23.9 | 2.40 | 15 14.8 | 55 50.7 | 1.82 | 14 51.0 | 54 23.3 | 0.59 |
| 25.0 | 15 48.7 | 57 55.2 | 2.38 | 15 9.1 | 55 29.8 | 1.66 | 14 49.5 | 54 17.6 | 0.37 |
| 25.5 | 15 41.0 | 57 26.9 | 2.33 | 15 4.0 | 55 11.1 | 1.46 | 14 48.6 | 54 14.5 | −0.15 |
| 26.0 | 15 33.5 | 56 59.4 | 2.24 | 14 59.6 | 54 54.7 | 1.26 | 14 48.5 | 54 13.9 | +0.06 |
| 26.5 | 15 26.4 | 56 33.3 | 2.12 | 14 55.8 | 54 40.9 | 1.05 | 14 49.0 | 54 15.9 | 0.27 |
| 27.0 | 15 19.7 | 56 8.8 | 1.97 | 14 52.7 | 54 29.4 | 0.85 | 14 50.2 | 54 20.3 | 0.47 |
| 27.5 | 15 13.6 | 55 46.2 | 1.79 | 14 50.3 | 54 20.4 | 0.64 | 14 52.1 | 54 27.1 | 0.66 |
| 28.0 | 15 8.0 | 55 25.8 | 1.61 | 14 48.5 | 54 14.0 | 0.44 | 14 54.5 | 54 36.1 | 0.84 |
| 28.5 | 15 3.0 | 55 7.5 | 1.43 | 14 47.4 | 54 10.0 | 0.24 | 14 57.5 | 54 47.1 | 1.00 |
| 29.0 | 14 58.7 | 54 51.5 | 1.24 | 14 47.0 | 54 8.3 | −0.04 | 15 1.0 | 55 0.0 | 1.15 |
| 29.5 | 14 55.0 | 54 37.7 | 1.05 | 14 47.1 | 54 8.9 | +0.14 | 15 5.0 | 55 14.6 | 1.27 |
| 30.0 | 14 51.8 | 54 26.2 | 0.86 | 14 47.9 | 54 11.6 | 0.31 | 15 9.3 | 55 30.4 | 1.35 |
| 30.5 | 14 49.3 | 54 17.0 | 0.68 | 14 49.1 | 54 16.3 | 0.47 | 15 13.8 | 55 47.0 | +1.42 |
| 31.0 | 14 47.4 | 54 10.0 | 0.50 | 14 50.9 | 54 22.8 | 0.61 | | | |
| 31.5 | 14 46.0 | 54 5.0 | −0.33 | 14 53.1 | 54 31.0 | +0.74 | | | |

$\Delta s = .272\ \pi$

## FOR WASHINGTON MEAN NOON AND MIDNIGHT.

| Day of Month. | OCTOBER. | | | NOVEMBER. | | | DECEMBER. | | |
|---|---|---|---|---|---|---|---|---|---|
| | Semi-diameter. | Horizontal Parallax. | Hourly Diff. | Semi-diameter. | Horizontal Parallax. | Hourly Diff. | Semi-diameter. | Horizontal Parallax. | Hourly Diff. |
| d | ′ ″ | ′ ″ | ″ | ′ ″ | ′ ″ | ″ | ′ ″ | ′ ″ | ″ |
| 1.0 | 15 18.5 | 56 4.3 | +1.47 | 16 0.6 | 58 39.0 | +1.55 | 16 29.8 | 60 26.1 | +0.99 |
| 1.5 | 15 23.3 | 56 21.9 | 1.50 | 16 5.4 | 58 56.6 | 1.37 | 16 32.5 | 60 36.1 | 0.65 |
| 2.0 | 15 28.2 | 56 40.1 | 1.50 | 16 9.5 | 59 11.8 | 1.17 | 16 34.1 | 60 41.8 | +0.30 |
| 2.5 | 15 33.2 | 56 58.0 | 1.47 | 16 13.0 | 59 24.5 | 0.96 | 16 34.5 | 60 43.4 | −0.04 |
| 3.0 | 15 37.9 | 57 15.4 | 1.42 | 16 15.8 | 59 34.7 | 0.73 | 16 33.9 | 60 40.9 | 0.37 |
| 3.5 | 15 42.4 | 57 31.9 | 1.34 | 16 17.8 | 59 42.0 | 0.49 | 16 32.1 | 60 34.6 | 0.68 |
| 4.0 | 15 46.6 | 57 47.4 | 1.25 | 16 19.0 | 59 46.5 | 0.26 | 16 29.4 | 60 24.8 | 0.95 |
| 4.5 | 15 50.5 | 58 2.0 | 1.16 | 16 19.5 | 59 48.2 | +0.04 | 16 25.9 | 60 11.9 | 1.19 |
| 5.0 | 15 54.2 | 58 15.3 | 1.05 | 16 19.3 | 59 47.4 | −0.17 | 16 21.7 | 59 56.5 | 1.38 |
| 5.5 | 15 57.4 | 58 27.2 | 0.94 | 16 18.4 | 59 44.3 | 0.36 | 16 17.0 | 59 39.0 | 1.53 |
| 6.0 | 16 0.3 | 58 37.8 | 0.83 | 16 17.0 | 59 39.0 | 0.52 | 16 11.8 | 59 19.9 | 1.64 |
| 6.5 | 16 2.8 | 58 47.0 | 0.71 | 16 15.0 | 59 31.9 | 0.66 | 16 6 3 | 58 59.8 | 1.70 |
| 7.0 | 16 5.0 | 58 54.9 | 0.60 | 16 12.7 | 59 23.2 | 0.78 | 16 0.7 | 58 39.1 | 1.74 |
| 7.5 | 16 6.7 | 59 1.4 | 0.49 | 16 10.0 | 59 13.3 | 0.88 | 15 55.0 | 58 18.3 | 1.73 |
| 8.0 | 16 8.1 | 59 6.6 | 0.38 | 16 7.0 | 59 2.3 | 0.96 | 15 49.3 | 57 57.6 | 1.71 |
| 8.5 | 16 9.2 | 59 10.6 | 0.28 | 16 3.7 | 58 50.4 | 1.01 | 15 43.8 | 57 37.3 | 1.67 |
| 9.0 | 16 10.0 | 59 13.4 | 0.18 | 16 0.4 | 58 38.0 | 1.06 | 15 38.4 | 57 17.5 | 1.61 |
| 9.5 | 16 10.4 | 59 14.9 | +0.08 | 15 56.9 | 58 25.1 | 1.09 | 15 33.3 | 56 58.6 | 1.55 |
| 10.0 | 16 10 5 | 59 15.4 | −0.01 | 15 53.2 | 58 11.9 | 1.12 | 15 28.4 | 56 40.5 | 1.47 |
| 10.5 | 16 10.3 | 59 14.6 | 0.11 | 15 49.5 | 57 58.3 | 1.14 | 15 23.7 | 56 23.3 | 1.40 |
| 11.0 | 16 9.8 | 59 12.6 | 0.21 | 15 45.7 | 57 44.4 | 1.16 | 15 19.2 | 56 6.9 | 1.33 |
| 11.5 | 16 8.9 | 59 9.5 | 0.31 | 15 41.9 | 57 30.3 | 1.18 | 15 15.0 | 55 51 4 | 1.25 |
| 12.0 | 16 7.7 | 59 5.1 | 0.42 | 15 38.0 | 57 16.0 | 1.20 | 15 11.0 | 55 36.9 | 1.17 |
| 12.5 | 16 6.2 | 58 59.3 | 0.55 | 15 34.1 | 57 1.5 | 1.22 | 15 7.4 | 55 23.4 | 1.10 |
| 13.0 | 16 4.2 | 58 52.0 | 0.67 | 15 30.1 | 56 46.8 | 1.22 | 15 3.9 | 55 10.7 | 1.02 |
| 13.5 | 16 1.8 | 58 43.2 | 0.79 | 15 26.1 | 56 32.1 | 1.23 | 15 0.7 | 54 58.8 | 0.95 |
| 14.0 | 15 58.9 | 58 32.9 | 0.92 | 15 22.0 | 56 17.3 | 1.23 | 14 57.7 | 54 47.8 | 0.87 |
| 14.5 | 15 55.8 | 58 21.2 | 1.04 | 15 18.0 | 56 2.5 | 1.22 | 14 55.0 | 54 37.9 | 0.79 |
| 15.0 | 15 52.2 | 58 8.0 | 1.16 | 15 14.1 | 55 48.0 | 1.20 | 14 52.6 | 54 28.9 | 0.71 |
| 15.5 | 15 48.2 | 57 53.4 | 1.27 | 15 10.2 | 55 33.7 | 1.18 | 14 50.4 | 54 20.8 | 0.62 |
| 16.0 | 15 43.9 | 57 37.6 | 1.37 | 15 6.4 | 55 19.8 | 1.13 | 14 48.5 | 54 13.9 | 0.52 |
| 16.5 | 15 39.3 | 57 20.7 | 1.44 | 15 2.8 | 55 6.6 | 1.07 | 14 46.9 | 54 8.2 | 0.42 |
| 17.0 | 15 34.5 | 57 3.1 | 1.50 | 14 59.5 | 54 54.3 | 1.00 | 14 45.7 | 54 3.7 | 0.32 |
| 17.5 | 15 29.5 | 56 44.9 | 1.53 | 14 56.3 | 54 42.7 | 0.91 | 14 44.8 | 54 0.6 | 0.19 |
| 18.0 | 15 24.5 | 56 26.5 | 1.53 | 14 53.5 | 54 32.5 | 0.79 | 14 44.5 | 53 59.2 | −0.05 |
| 18.5 | 15 19.5 | 56 8.2 | 1.52 | 14 51.1 | 54 23.7 | 0.67 | 14 44.5 | 53 59.4 | +0.09 |
| 19.0 | 15 14.6 | 55 50.2 | 1.47 | 14 49.2 | 54 16.5 | 0.53 | 14 45.0 | 54 1.4 | 0.25 |
| 19.5 | 15 9.9 | 55 32.9 | 1.40 | 14 47.7 | 54 11.1 | 0.37 | 14 46.2 | 54 5.4 | 0.42 |
| 20.0 | 15 5.5 | 55 16.7 | 1.30 | 14 46.8 | 54 7.7 | 0.20 | 14 47.8 | 54 11.5 | 0.60 |
| 20.5 | 15 1.5 | 55 1.8 | 1.18 | 14 46.4 | 54 6.4 | −0.01 | 14 50.0 | 54 19.7 | 0.78 |
| 21.0 | 14 57.9 | 54 48.4 | 1.04 | 14 46.7 | 54 7.4 | +0.19 | 14 52.9 | 54 30.2 | 0.97 |
| 21.5 | 14 54.7 | 54 36.9 | 0.87 | 14 47.6 | 54 10.9 | 0.39 | 14 56.4 | 54 43.0 | 1.17 |
| 22.0 | 14 52.2 | 54 27.6 | 0.69 | 14 49.3 | 54 16.9 | 0.60 | 15 0.5 | 54 58.2 | 1.37 |
| 22.5 | 14 50.2 | 54 20.4 | 0.50 | 14 51.6 | 54 25.4 | 0.82 | 15 5.3 | 55 15.8 | 1.57 |
| 23.0 | 14 48.9 | 54 15.5 | 0.30 | 14 54.6 | 54 36.5 | 1.04 | 15 10.7 | 55 35.8 | 1.75 |
| 23.5 | 14 48.3 | 54 13.2 | −0.08 | 14 58.4 | 54 50.3 | 1.25 | 15 16.8 | 55 57.9 | 1.93 |
| 24.0 | 14 48.4 | 54 13.5 | +0.13 | 15 2.8 | 55 6.5 | 1.45 | 15 23.4 | 56 22.1 | 2.10 |
| 24.5 | 14 49.2 | 54 16.5 | 0.35 | 15 7.8 | 55 25.0 | 1.64 | 15 30.5 | 56 48.2 | 2.24 |
| 25.0 | 14 50.2 | 54 22.0 | 0.58 | 15 13.5 | 55 45.8 | 1.82 | 15 38.0 | 57 15.8 | 2.36 |
| 25.5 | 14 52.9 | 54 30.2 | 0.79 | 15 19.6 | 56 8.6 | 1.98 | 15 45.8 | 57 44.7 | 2.44 |
| 26.0 | 14 55.9 | 54 41.0 | 0.99 | 15 26.4 | 56 33.1 | 2.11 | 15 53.9 | 58 14.2 | 2.47 |
| 26.5 | 14 59.4 | 54 54.1 | 1.19 | 15 33.4 | 56 59.0 | 2.20 | 16 1.9 | 58 43.7 | 2.45 |
| 27.0 | 15 3.6 | 55 9.5 | 1.37 | 15 40.7 | 57 25.8 | 2.26 | 16 9.8 | 59 12.7 | 2.37 |
| 27.5 | 15 8.3 | 55 26.9 | 1.53 | 15 48.1 | 57 53.1 | 2.27 | 16 17.4 | 59 40.4 | 2.23 |
| 28.0 | 15 13.5 | 55 46.0 | 1.66 | 15 55.5 | 58 20.2 | 2.24 | 16 24.4 | 60 6.1 | 2.03 |
| 28.5 | 15 19.1 | 56 6.7 | 1.77 | 16 2.7 | 58 46.6 | 2.15 | 16 30.6 | 60 29.0 | 1.77 |
| 29.0 | 15 25.1 | 56 28.5 | 1.85 | 16 9.5 | 59 11.6 | 2.01 | 16 35.9 | 60 48.5 | 1.46 |
| 29.5 | 15 31.2 | 56 51.0 | 1.89 | 16 15.8 | 59 34.7 | 1.82 | 16 40.1 | 61 3.9 | 1.10 |
| 30.0 | 15 37.4 | 57 13.8 | 1.90 | 16 21.3 | 59 55.0 | 1.58 | 16 43.0 | 61 14.7 | 0.70 |
| 30.5 | 15 43.6 | 57 36.4 | 1.87 | 16 26.0 | 60 12.3 | +1.30 | 16 44 7 | 61 20.8 | +0.29 |
| 31.0 | 15 49.5 | 57 58.4 | 1.80 | Δs = .272 π | | | 16 44.9 | 61 21.7 | −0.13 |
| 31.5 | 15 55.3 | 58 19.5 | +1.70 | | | | 16 43.9 | 61 17.7 | −0.54 |

## WASHINGTON MEAN TIME.

### PHASES.

| Month. | First Quarter. | Full Moon. | Last Quarter. | New Moon. | First Quarter. | Full Moon. |
|---|---|---|---|---|---|---|
| | d h m | d h m | d h m | d h m | d h m | d h m |
| January | 3 22 16.0 | 10 13 14.9 | 17 15 41.4 | 25 20 33.5 | | |
| February | 2 8 45.2 | 9 0 38.7 | 16 11 47.8 | 24 13 12.2 | | |
| March | 2 16 39.6 | 9 13 4.1 | 17 8 16.3 | 25 3 3.5 | 31 23 3.8 | |
| April | | 8 2 30.8 | 16 3 29.4 | 23 13 55.4 | 30 5 18.9 | |
| May | | 7 16 44.7 | 15 20 18.6 | 22 22 17.1 | 29 12 40.4 | |
| June | | 6 7 29.2 | 14 10 6.3 | 21 5 8.8 | 27 22 5.9 | |
| July | | 5 22 29.7 | 13 20 47.6 | 20 11 44.7 | 27 10 10.7 | |
| August | | 4 13 29.6 | 12 4 50.5 | 18 19 17.5 | 26 1 9.6 | |
| September | | 3 4 5.0 | 10 11 12.9 | 17 4 46.4 | 24 18 54.9 | |
| October | | 2 17 48.0 | 9 17 11.7 | 16 16 49.0 | 24 14 46.2 | |
| November | | 1 6 22.7 | 8 0 9.2 | 15 7 39.5 | 23 11 18.4 | 30 17 55.8 |
| December | | | 7 9 15.3 | 15 1 5.7 | 23 6 33.2 | 30 4 50.9 |

### APOGEE, PERIGEE, AND GREATEST LIBRATION.

| Month. | Perigee. | Apogee. | Perigee. | GREATEST LIBRATION. | | |
|---|---|---|---|---|---|---|
| | d h | d h | d h | d h m | d h m | d h m |
| January | 9 11.0 | 21 16.1 | | 3 0 31 N.E. | 15 6 25 N.W. | 30 10 13 N.E. |
| February | 6 16.1 | 18 10.8 | | 12 10 4 N.W. | 25 14 36 N.E. | |
| March | 4 20.6 | 17 7.4 | 29 17.0 | 11 2 22 N.W. | 23 11 45 N.E. | |
| April | | 14 2.6 | 25 23.1 | 6 21 24 N.W. | 20 4 8 N.E. | |
| May | | 11 18.3 | 24 2.1 | 3 4 22 N.W. | 18 5 16 N.E. | 31 1 43 N.W. |
| June | | 8 4.8 | 21 10.5 | | 15 9 40 N.E. | 27 14 4 N.W. |
| July | | 5 6.9 | 19 19.9 | | 13 12 56 N.E. | 25 18 29 N.W. |
| August | | 1 13.6 | 17 2.4 | | 10 7 51 N.E. | 22 21 11 N.W. |
| August | | 29 2.9 | | | | |
| September | 13 22.8 | 25 21.8 | | | 6 3 25 N.E. | 19 19 29 N.W. |
| October | 9 22.4 | 23 16.6 | | 2 11 5 N.E. | 17 4 15 N.W. | 29 17 43 N.E. |
| November | 4 14.4 | 20 12.6 | | 12 12 52 N.W. | 26 16 22 N.E. | |
| December | 2 10.8 | 18 4.4 | 30 20.0 | 9 4 51 N.W. | 25 10 41 N.E. | |

### MOON'S EQUATOR.

The moon's libration in latitude and longitude, at any time, may be found by means of the following formulas and tables:

$I$ = the inclination to the ecliptic of the moon's equator = 1° 28′.8,

$\Omega$ = mean longitude of the moon's ascending node, (see page 248),
= mean longitude of the descending node of the moon's equator,

$C$ = the angle at the centre of the moon's disc made by a meridian of the moon with the circle of declination, reckoned from north to east on the apparent disc,

$i$, $\Delta$, $\Omega'$, and ☾ are defined on the next page, where their values for the year are given.

$\lambda$, $\beta$, $a'$, and $\delta'$ the apparent longitude, latitude, right ascension, and declination of the moon affected with parallax.

$\lambda'$ = the selenocentric longitude of the earth, reckoned on the moon's equator from its descending node, $\Omega$.

$$\left.\begin{aligned} \Delta\lambda &= -0'.57 \sin 2(\Omega - \lambda) \\ a &= \sin I \cos(\Omega - \lambda) \\ \tan B &= \tan I \sin(\Omega - \lambda) \\ \lambda' &= \lambda + \Delta\lambda + a\,b \end{aligned}\right\}\text{See table, page 343.}$$

The libration in latitude $= b = B - \beta$,

" " longitude $= l = \lambda' - \text{☾}$.

$$\sin C = \sin i \,\frac{\cos(\lambda' + \Delta - \Omega)}{\cos \delta'} = -\sin i\,\frac{\cos(a' - \Omega')}{\cos b}.$$

## WASHINGTON MEAN TIME.

| Mean Noon. | | MOON'S EQUATOR. | | | ☾ Moon's Mean Longitude. |
|---|---|---|---|---|---|
| | | *i* Inclination to the Earth's Equator. | △ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic. | ☊′ Ascend'g Node on Earth's Equator. | |
| Jan. | 1 | 21° 58′.9 | 183° 31′.6 | 359° 46′.3 | 342° 8′.5 |
| | 11 | 21 58.8 | 182 57.8 | 359 48.5 | 113 54.3 |
| | 21 | 21 58.7 | 182 24.1 | 359 50.7 | 245 40.1 |
| | 31 | 21 58.6 | 181 50.3 | 359 52.9 | 17 26.0 |
| Feb. | 10 | 21 58.6 | 181 16.5 | 359 55.1 | 149 11.8 |
| | 20 | 21 58.5 | 180 42.7 | 359 57.3 | 280 57.6 |
| March | 1 | 21 58.6 | 180 8.9 | 359 59.4 | 52 43.5 |
| | 11 | 21 58.7 | 179 35.1 | 0 1.6 | 184 29.3 |
| | 21 | 21 58.8 | 179 1.3 | 0 3.8 | 316 15.2 |
| | 31 | 21 58.8 | 178 27.5 | 0 6.0 | 88 1.0 |
| April | 10 | 21 58.8 | 177 53.7 | 0 8.1 | 219 46.8 |
| | 20 | 21 58.9 | 177 19.9 | 0 10.3 | 351 32.7 |
| | 30 | 21 58.9 | 176 46.1 | 0 12.5 | 123 18.5 |
| May | 10 | 21 58.9 | 176 12.3 | 0 14.7 | 255 4.3 |
| | 20 | 21 59.0 | 175 38.5 | 0 16.9 | 26 50.2 |
| | 30 | 21 59.0 | 175 4.7 | 0 19.1 | 158 36.0 |
| June | 9 | 21 59.1 | 174 30.9 | 0 21.3 | 290 21.9 |
| | 19 | 21 59.2 | 173 57.1 | 0 23.5 | 62 7.7 |
| | 29 | 21 59.3 | 173 23.3 | 0 25.7 | 193 53.5 |
| July | 9 | 21 59.4 | 172 49.5 | 0 27.8 | 325 39.4 |
| | 19 | 21 59.5 | 172 15.8 | 0 30.0 | 97 25.2 |
| | 29 | 21 59.6 | 171 42.0 | 0 32.2 | 229 11.1 |
| Aug. | 8 | 21 59.7 | 171 8.3 | 0 34.3 | 0 56.9 |
| | 18 | 21 59.8 | 170 34.5 | 0 36.5 | 132 42.7 |
| | 28 | 22 0.0 | 170 0.8 | 0 38.6 | 264 28.6 |
| Sept. | 7 | 22 0.1 | 169 27.0 | 0 40.8 | 36 14.4 |
| | 17 | 22 0.3 | 168 53.3 | 0 43.0 | 168 0.2 |
| | 27 | 22 0.4 | 168 19.5 | 0 45.1 | 299 46.1 |
| Oct. | 7 | 22 0.6 | 167 45.8 | 0 47.3 | 71 31.9 |
| | 17 | 22 0.8 | 167 12.0 | 0 49.5 | 203 17.8 |
| | 27 | 22 1.0 | 166 38.3 | 0 51.6 | 335 3.6 |
| Nov. | 6 | 22 1.2 | 166 4.5 | 0 53.7 | 106 49.4 |
| | 16 | 22 1.4 | 165 30.8 | 0 55.8 | 238 35.3 |
| | 26 | 22 1.6 | 164 57.1 | 0 57.9 | 10 21.1 |
| Dec. | 6 | 22 1.9 | 164 23.4 | 1 0.0 | 142 6.9 |
| | 16 | 22 2.1 | 163 49.7 | 1 2.1 | 273 52.8 |
| | 26 | 22 2.3 | 163 16.0 | 1 4.2 | 45 38.6 |
| | 36 | 22 2.5 | 162 42.3 | 1 6.3 | 177 24.5 |

| Mean Solar Days. | Motion of ☾. |
|---|---|
| 0.1 | 1° 19′.06 |
| 0.2 | 2 38.12 |
| 0.3 | 3 57.18 |
| 0.4 | 5 16.23 |
| 0.5 | 6 35.29 |
| 0.6 | 7 54.35 |
| 0.7 | 9 13.41 |
| 0.8 | 10 32.47 |
| 0.9 | 11 51.53 |
| 1.0 | 13 10.58 |
| 2.0 | 26 21.17 |
| 3.0 | 39 31.75 |
| 4.0 | 52 42.33 |
| 5.0 | 65 52.92 |
| 6.0 | 79 3.50 |
| 7.0 | 92 14.09 |
| 8.0 | 105 24.67 |
| 9.0 | 118 35.25 |
| 10.0 | 131 45.84 |
| Hours. | |
| 1 | 0 32.94 |
| 2 | 1 5.88 |
| 3 | 1 38.82 |
| 4 | 2 11.76 |
| 5 | 2 44.70 |
| 6 | 3 17.65 |
| 7 | 3 50.59 |
| 8 | 4 23.53 |
| 9 | 4 56.47 |
| 10 | 5 29.41 |
| 11 | 6 2.35 |
| 12 | 6 35.29 |
| 13 | 7 8.23 |
| 14 | 7 41.17 |
| 15 | 8 14.11 |
| 16 | 8 47.06 |
| 17 | 9 20.00 |
| 18 | 9 52.94 |
| 19 | 10 25.88 |
| 20 | 10 58.82 |
| 21 | 11 31.76 |
| 22 | 12 4.70 |
| 23 | 12 37.64 |

## TABLE FOR THE LIBRATION OF THE MOON.

Argument, (☊—λ) or (☊—λ—180°.)

| ☊—λ | Δ λ | $\frac{1}{a}$ | B | ☊—λ | ☊—λ | Δ λ | $\frac{1}{a}$ | B | ☊—λ |
|---|---|---|---|---|---|---|---|---|---|
| 0° | 0′.0 | 39 | 0° 0′.0 | 180° | 46° | 0′.6 | 56 | 1° 3′.9 | 134° |
| 1 | 0.0 | 39 | 0 1.6 | 179 | 47 | 0.6 | 57 | 1 4.9 | 133 |
| 2 | 0.0 | 39 | 0 3.1 | 178 | 48 | 0.6 | 58 | 1 6.0 | 132 |
| 3 | 0.1 | 39 | 0 4.7 | 177 | 49 | 0.6 | 59 | 1 7.0 | 131 |
| 4 | 0.1 | 39 | 0 6.2 | 176 | 50 | 0.6 | 60 | 1 8.0 | 130 |
| 5 | 0.1 | 39 | 0 7.7 | 175 | 51 | 0.6 | 62 | 1 9.0 | 129 |
| 6 | 0.2 | 39 | 0 9.3 | 174 | 52 | 0.6 | 63 | 1 10.0 | 128 |
| 7 | 0.2 | 39 | 0 10.8 | 173 | 53 | 0.5 | 64 | 1 10.9 | 127 |
| 8 | 0.2 | 39 | 0 12.4 | 172 | 54 | 0.5 | 66 | 1 11.8 | 126 |
| 9 | 0.2 | 39 | 0 13.9 | 171 | 55 | 0.5 | 67 | 1 12.7 | 125 |
| 10 | 0.2 | 39 | 0 15.4 | 170 | 56 | 0.5 | 69 | 1 13.6 | 124 |
| 11 | 0.3 | 39 | 0 16.9 | 169 | 57 | 0.5 | 71 | 1 14.5 | 123 |
| 12 | 0.3 | 40 | 0 18.5 | 168 | 58 | 0.5 | 73 | 1 15.3 | 122 |
| 13 | 0.3 | 40 | 0 20.0 | 167 | 59 | 0.5 | 75 | 1 16.1 | 121 |
| 14 | 0.3 | 40 | 0 21.5 | 166 | 60 | 0.5 | 77 | 1 16.9 | 120 |
| 15 | 0.3 | 40 | 0 23.0 | 165 | 61 | 0.5 | 80 | 1 17.6 | 119 |
| 16 | 0.3 | 40 | 0 24.5 | 164 | 62 | 0.5 | 83 | 1 18.4 | 118 |
| 17 | 0.3 | 40 | 0 26.0 | 163 | 63 | 0.5 | 86 | 1 19.1 | 117 |
| 18 | 0.3 | 41 | 0 27.4 | 162 | 64 | 0.5 | 89 | 1 19.8 | 116 |
| 19 | 0.4 | 41 | 0 28.9 | 161 | 65 | 0.4 | 92 | 1 20.4 | 115 |
| 20 | 0.4 | 41 | 0 30.4 | 160 | 66 | 0.4 | 95 | 1 21.1 | 114 |
| 21 | 0.4 | 41 | 0 31.8 | 159 | 67 | 0.4 | 99 | 1 21.7 | 113 |
| 22 | 0.4 | 42 | 0 33.2 | 158 | 68 | 0.4 | 103 | 1 22.3 | 112 |
| 23 | 0.4 | 42 | 0 34.7 | 157 | 69 | 0.4 | 108 | 1 22.9 | 111 |
| 24 | 0.4 | 42 | 0 36.1 | 156 | 70 | 0.4 | 113 | 1 23.4 | 110 |
| 25 | 0.4 | 43 | 0 37.5 | 155 | 71 | 0.4 | 119 | 1 23.9 | 109 |
| 26 | 0.5 | 43 | 0 38.9 | 154 | 72 | 0.4 | 125 | 1 24.4 | 108 |
| 27 | 0.5 | 43 | 0 40.3 | 153 | 73 | 0.4 | 132 | 1 24.9 | 107 |
| 28 | 0.5 | 44 | 0 41.7 | 152 | 74 | 0.3 | 141 | 1 25.3 | 106 |
| 29 | 0.5 | 44 | 0 43.1 | 151 | 75 | 0.3 | 150 | 1 25.7 | 105 |
| 30 | 0.5 | 45 | 0 44.4 | 150 | 76 | 0.3 | 160 | 1 26.1 | 104 |
| 31 | 0.5 | 45 | 0 45.7 | 149 | 77 | 0.3 | 172 | 1 26.5 | 103 |
| 32 | 0.5 | 46 | 0 47.0 | 148 | 78 | 0.2 | 186 | 1 26.8 | 102 |
| 33 | 0.5 | 46 | 0 48.4 | 147 | 79 | 0.2 | 202 | 1 27.1 | 101 |
| 34 | 0.5 | 47 | 0 49.7 | 146 | 80 | 0.2 | 222 | 1 27.4 | 100 |
| 35 | 0.5 | 47 | 0 51.0 | 145 | 81 | 0.2 | 247 | 1 27.7 | 99 |
| 36 | 0.5 | 48 | 0 52.2 | 144 | 82 | 0.2 | 278 | 1 27.9 | 98 |
| 37 | 0.5 | 48 | 0 53.4 | 143 | 83 | 0.1 | 318 | 1 28.1 | 97 |
| 38 | 0.6 | 49 | 0 54.7 | 142 | 84 | 0.1 | 370 | 1 28.3 | 96 |
| 39 | 0.6 | 50 | 0 55.9 | 141 | 85 | 0.1 | 440 | 1 28.5 | 95 |
| 40 | 0.6 | 50 | 0 57.1 | 140 | 86 | 0.1 | 555 | 1 28.6 | 94 |
| 41 | 0.6 | 51 | 0 58.3 | 139 | 87 | 0.1 | 740 | 1 28.7 | 93 |
| 42 | 0.6 | 52 | 0 59.4 | 138 | 88 | 0.0 | 1110 | 1 28.7 | 92 |
| 43 | 0.6 | 53 | 1 0.6 | 137 | 89 | 0.0 | 2220 | 1 28.8 | 91 |
| 44 | 0.6 | 54 | 1 1.7 | 136 | 90 | 0.0 | ∞ | 1 28.8 | 90 |
| 45 | 0.6 | 55 | 1 2.8 | 135 |  |  |  |  |  |

Δ λ has the sign of tan (λ—☊)

*a* has the sign of cos (☊—λ)

*B* has the sign of sin (☊—λ)

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Jan. 1 | 19 3 45.25 | 17.860 | −24 39 29.7 | +20.85 | 1 0 21.0 | 19 3 51.50 | 17.900 | −24 39 22.4 | +20.95 |
| 2 | 19 10 54.03 | 17.871 | 24 30 23.1 | 24.71 | 2 0 24.2 | 19 11 1.24 | 17.911 | 24 30 13.1 | 24.83 |
| 3 | 19 18 2.97 | 17.873 | 24 19 43.6 | 28.60 | 3 0 27.4 | 19 18 11.14 | 17.913 | 24 19 30.5 | 28.74 |
| 4 | 19 25 11.87 | 17.867 | 24 7 30.3 | 32.52 | 4 0 30.6 | 19 25 20.99 | 17.906 | 24 7 13.7 | 32.68 |
| 5 | 19 32 20.49 | 17.850 | 23 53 42.7 | 36.45 | 5 0 33.8 | 19 32 30.56 | 17.889 | 23 53 22.1 | 36.62 |
| 6 | 19 39 28.61 | 17.824 | 23 38 20.4 | 40.41 | 6 0 37.0 | 19 39 39.61 | 17.862 | 23 37 55.5 | 40.60 |
| 7 | 19 46 35.94 | 17.785 | 23 21 23.1 | 44.37 | 7 0 40.2 | 19 46 47.86 | 17.823 | 23 20 53.4 | 44.58 |
| 8 | 19 53 42.18 | 17.733 | 23 2 50.8 | 48.33 | 8 0 43.4 | 19 53 55.00 | 17.770 | 23 2 15.9 | 48.55 |
| 9 | 20 0 47.01 | 17.667 | 22 42 43.5 | 52.28 | 9 0 46.5 | 20 1 0.71 | 17.703 | 22 42 3.0 | 52.52 |
| 10 | 20 7 50.05 | 17.584 | 22 21 1.7 | 56.20 | 10 0 49.6 | 20 8 4.60 | 17.619 | 22 20 15.2 | 56.46 |
| 11 | 20 14 50.91 | 17.484 | 21 57 46.0 | 60.09 | 11 0 52.7 | 20 15 6.27 | 17.517 | 21 56 53.1 | 60.36 |
| 12 | 20 21 49.13 | 17.363 | 21 32 57.6 | 63.93 | 12 0 55.7 | 20 22 5.26 | 17.394 | 21 31 58.1 | 64.21 |
| 13 | 20 28 44.18 | 17.220 | 21 6 37.9 | 67.70 | 13 0 58.7 | 20 29 1.04 | 17.249 | 21 5 31.5 | 67.99 |
| 14 | 20 35 35.46 | 17.049 | 20 38 48.9 | 71.36 | 14 1 1.7 | 20 35 53.00 | 17.075 | 20 37 35.4 | 71.66 |
| 15 | 20 42 22.30 | 16.850 | 20 9 33.5 | 74.91 | 15 1 4.5 | 20 42 40.44 | 16.873 | 20 8 12.8 | 75.21 |
| 16 | 20 49 3.99 | 16.618 | 19 38 54.8 | 78.30 | 16 1 7.3 | 20 49 22.62 | 16.637 | 19 37 26.8 | 78.60 |
| 17 | 20 55 39.65 | 16.346 | 19 6 56.8 | 81.50 | 17 1 9.9 | 20 55 58.68 | 16.361 | 19 5 21.5 | 81.79 |
| 18 | 21 2 8.29 | 16.033 | 18 33 44.6 | 84.46 | 18 1 12.4 | 21 2 27.63 | 16.043 | 18 32 2.5 | 84.74 |
| 19 | 21 8 28.81 | 15.669 | 17 59 25.0 | 87.13 | 19 1 14.8 | 21 8 48.34 | 15.673 | 17 57 36.3 | 87.40 |
| 20 | 21 14 39.95 | 15.250 | 17 24 5.1 | 89.46 | 20 1 17.0 | 21 14 59.53 | 15.248 | 17 22 10.1 | 89.71 |
| 21 | 21 20 40.28 | 14.766 | 16 47 54.0 | 91.38 | 21 1 19.1 | 21 20 59.73 | 14.758 | 16 45 53.4 | 91.60 |
| 22 | 21 26 28.18 | 14.212 | 16 11 2.4 | 92.83 | 22 1 21.0 | 21 26 47.34 | 14.196 | 16 8 57.1 | 93.01 |
| 23 | 21 32 1.86 | 13.580 | 15 33 42.5 | 93.73 | 23 1 22.6 | 21 32 20.52 | 13.555 | 15 31 33.5 | 93.86 |
| 24 | 21 37 19.34 | 12.861 | 14 56 8.6 | 93.97 | 24 1 23.9 | 21 37 37.30 | 12.827 | 14 53 57.2 | 94.04 |
| 25 | 21 42 18.43 | 12.046 | 14 18 37.6 | 93.49 | 25 1 24.9 | 21 42 35.44 | 12.002 | 14 16 25.3 | 93.49 |
| 26 | 21 46 56.74 | 11.129 | 13 41 27.4 | 92.21 | 26 1 25.6 | 21 47 12.57 | 11.075 | 13 39 16.0 | 92.14 |
| 27 | 21 51 11.74 | 10.101 | 13 4 58.8 | 90.02 | 27 1 25.9 | 21 51 26.15 | 10.037 | 13 2 50.1 | 89.87 |
| 28 | 21 55 0.78 | 8.961 | 12 29 34.5 | 86.84 | 28 1 25.7 | 21 55 13.53 | 8.888 | 12 27 30.5 | 86.60 |
| 29 | 21 58 21.05 | 7.709 | 11 55 38.7 | 82.62 | 29 1 25.1 | 21 58 31.93 | 7.627 | 11 53 41.8 | 82.29 |
| 30 | 22 1 9.88 | 6.341 | 11 23 37.2 | 77.32 | 30 1 24.0 | 22 1 18.69 | 6.252 | 11 21 49.3 | 76.90 |
| 31 | 22 3 24.59 | 4.866 | 10 52 56.5 | 70.89 | 31 1 22.3 | 22 3 31.20 | 4.773 | 10 52 19.6 | 70.39 |
| Feb. 1 | 22 5 2.74 | 3.299 | 10 27 3.2 | 63.36 | 1 1 19.9 | 22 5 7.07 | 3.204 | 10 25 39.2 | 62.80 |
| 2 | 22 6 2.30 | +1.652 | 10 3 23.6 | 54.77 | 2 1 16.9 | 22 6 4.37 | +1.560 | 10 2 13.7 | 54.16 |
| 3 | 22 6 21.67 | −0.045 | 9 43 21.8 | 45.22 | 3 1 13.2 | 22 6 21.57 | −0.131 | 9 42 26.9 | 44.59 |
| 4 | 22 5 59.98 | 1.764 | 9 27 19.6 | 34.85 | 4 1 8.9 | 22 5 57.91 | 1.840 | 9 26 40.0 | 34.23 |
| 5 | 22 4 57.19 | 3.464 | 9 15 33.8 | 23.87 | 5 1 3.8 | 22 4 53.47 | 3.525 | 9 15 8.7 | 23.29 |
| 6 | 22 3 14.22 | 5.102 | 9 8 16.8 | 12.51 | 6 0 58.3 | 22 3 9.24 | 5.145 | 9 8 4.9 | 12.00 |
| 7 | 22 0 53.13 | 6.632 | 9 5 34.2 | + 1.05 | 7 0 52.0 | 22 0 47.37 | 6.654 | 9 5 33.5 | + 0.61 |
| 8 | 21 57 57.09 | 8.008 | 9 7 24.5 | −10.18 | 8 0 45.1 | 21 57 51.05 | 8.009 | 9 7 32.3 | −10.47 |
| 9 | 21 54 30.39 | 9.179 | 9 13 38.4 | 20.86 | 9 0 37.7 | 21 54 24.61 | 9.159 | 9 13 51.6 | 21.02 |
| 10 | 21 50 38.43 | 10.108 | 9 23 58.6 | 30.65 | 10 0 29.9 | 21 50 33.37 | 10.070 | 9 24 14.0 | 30.67 |
| 11 | 21 46 27.42 | 10.762 | 9 38 0.5 | 39.29 | 11 0 21.8 | 21 46 23.50 | 10.709 | 9 38 14.9 | 39.19 |
| 12 | 21 42 4.15 | 11.126 | 9 55 13.6 | 46.56 | 12 0 13.6 | 21 42 1.63 | 11.064 | 9 55 24.1 | 46.36 |
| 13 | 21 37 35.69 | 11.196 | 10 15 3.2 | 52.31 | 13 0 5.2 | 21 37 34.72 | 11.132 | 10 15 7.8 | 52.03 |
| | | | | | 13 23 56.8 | 21 33 9.52 | 10.923 | 10 36 48.9 | 56.15 |
| 14 | 21 33 8.95 | 10.985 | 10 36 51.8 | 56.48 | 14 23 48.7 | 21 28 52.47 | 10.457 | 10 59 50.8 | 58.77 |
| 15 | 21 28 50.49 | 10.511 | 11 0 2.0 | 59.11 | 15 23 40.7 | 21 24 49.37 | 9.768 | 11 23 38.0 | 59.95 |
| 16 | 21 24 46.22 | 9.810 | 11 23 57.4 | 60.28 | 16 23 33.0 | 21 21 5.09 | 8.894 | 11 47 37.7 | 59.83 |
| 17 | 21 21 1.08 | 8.922 | 11 48 4.8 | 60.13 | 17 23 25.8 | 21 17 43.59 | 7.877 | 12 11 21.2 | 58.62 |
| 18 | 21 17 39.08 | 7.890 | 12 11 54.8 | 58.87 | 18 23 18.9 | 21 14 47.83 | 6.756 | 12 34 24.3 | 56.49 |
| 19 | 21 14 43.19 | 6.754 | 12 35 3.1 | 56.67 | 19 23 12.5 | 21 12 19.86 | 5.567 | 12 56 26.5 | 53.60 |
| 20 | 21 12 15.46 | 5.551 | 12 57 9.0 | 53.72 | 20 23 6.6 | 21 10 20.88 | 4.346 | 13 17 12.1 | 50.13 |
| 21 | 21 10 17.02 | 4.318 | 13 17 56.8 | 50.19 | 21 23 1.2 | 21 8 51.34 | 3.116 | 13 36 29.4 | 46.24 |
| 22 | 21 8 48.30 | 3.079 | 13 37 14.8 | 46.24 | 22 22 56.3 | 21 7 51.12 | 1.907 | 13 54 9.0 | 42.04 |
| 23 | 21 7 49.12 | 1.860 | 13 54 53.7 | 41.98 | 23 22 51.8 | 21 7 19.56 | −0.731 | 14 10 5.1 | 37.61 |
| 24 | 21 7 18.76 | −0.678 | 14 10 47.8 | 37.51 | 24 22 47.8 | 21 7 15.73 | +0.403 | 14 24 13.5 | 33.08 |
| 25 | 21 7 16.25 | +0.459 | 14 24 53.2 | 32.94 | 25 22 44.3 | 21 7 38.42 | 1.480 | 14 36 32.4 | 28.49 |
| 26 | 21 7 40.33 | 1.538 | 14 37 8.2 | 28.31 | 26 22 41.1 | 21 8 26.25 | 2.496 | 14 47 0.5 | 23.85 |
| 27 | 21 8 29.58 | 2.555 | 14 47 31.7 | 23.65 | 27 22 38.4 | 21 9 37.74 | 3.452 | 14 55 37.6 | 19.25 |
| 28 | 21 9 42.49 | 3.510 | 14 56 3.7 | 19.02 | 28 22 36.0 | 21 11 11.42 | 4.344 | 15 2 24.8 | 14.68 |
| 29 | 21 11 17.55 | 4.401 | 15 2 45.2 | 14.44 | 29 22 34.0 | 21 13 5.76 | 5.175 | 15 7 23.1 | 10.17 |
| 30 | 21 13 13.23 | +5.229 | −15 7 37.5 | − 9.92 | 30 22 32.3 | 21 15 19.31 | +5.946 | −15 10 33.9 | − 5.73 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Mar. 1 | 21 13 13.23 | +5.229 | -15 7 37.5 | - 9.92 | 1 22 32.3 | 21 15 19.31 | +5.946 | -15 10 33.9 | - 5.73 |
| 2 | 21 15 28.05 | 5.998 | 15 10 42.1 | 5.47 | 2 22 30.8 | 21 17 50.71 | 6.661 | 15 11 58.8 | - 1.35 |
| 3 | 21 18 0.65 | 6.709 | 15 12 0.6 | - 1.08 | 3 22 29.7 | 21 20 38.59 | 7.320 | 15 11 39.3 | + 2.95 |
| 4 | 21 20 49.65 | 7.365 | 15 11 34.8 | + 3.22 | 4 22 28.8 | 21 23 41.69 | 7.930 | 15 9 37.6 | 7.18 |
| 5 | 21 23 53.79 | 7.971 | 15 9 26.5 | 7.45 | 5 22 28.2 | 21 26 58.90 | 8.495 | 15 5 55.3 | 11.33 |
| 6 | 21 27 11.93 | 8.532 | 15 5 37.8 | 11.60 | 6 22 27.7 | 21 30 29.08 | 9.014 | 15 0 34.2 | 15.42 |
| 7 | 21 30 42.97 | 9.048 | 15 0 10.3 | 15.68 | 7 22 27.5 | 21 34 11.23 | 9.494 | 14 53 36.0 | 19.42 |
| 8 | 21 34 25.90 | 9.524 | 14 53 5.8 | 19.68 | 8 22 27.4 | 21 38 4.45 | 9.935 | 14 45 2.3 | 23.37 |
| 9 | 21 38 19.80 | 9.962 | 14 44 26.0 | 23.62 | 9 22 27.5 | 21 42 7.88 | 10.345 | 14 34 54.7 | 27.25 |
| 10 | 21 42 23.84 | 10.369 | 14 34 12.5 | 27.49 | 10 22 27.8 | 21 46 20.77 | 10.724 | 14 23 14.9 | 31.07 |
| 11 | 21 46 37.26 | 10.745 | 14 22 27.0 | 31.30 | 11 22 28.3 | 21 50 42.39 | 11.073 | 14 10 4.4 | 34.82 |
| 12 | 21 50 59.34 | 11.091 | 14 9 11.0 | 35.04 | 12 22 28.8 | 21 55 12.09 | 11.397 | 13 55 24.3 | 38.51 |
| 13 | 21 55 29.44 | 11.412 | 13 54 25.6 | 38.72 | 13 22 29.5 | 21 59 49.33 | 11.700 | 13 39 16.3 | 42.15 |
| 14 | 22 0 6.99 | 11.712 | 13 38 12.6 | 42.35 | 14 22 30.2 | 22 4 33.56 | 11.982 | 13 21 41.7 | 45.73 |
| 15 | 22 4 51.49 | 11.992 | 13 20 33.2 | 45.92 | 15 22 31.1 | 22 9 24.32 | 12.244 | 13 2 41.6 | 49.27 |
| 16 | 22 9 42.46 | 12.252 | 13 1 28.6 | 49.45 | 16 22 32.1 | 22 14 21.16 | 12.490 | 12 42 17.4 | 52.75 |
| 17 | 22 14 39.45 | 12.495 | 12 41 0.1 | 52.92 | 17 22 33.2 | 22 19 23.70 | 12.721 | 12 20 30.3 | 56.18 |
| 18 | 22 19 42.10 | 12.724 | 12 19 9.0 | 56.34 | 18 22 34.4 | 22 24 31.63 | 12.938 | 11 57 21.4 | 59.56 |
| 19 | 22 24 50.08 | 12.939 | 11 55 56.3 | 59.71 | 19 22 35.7 | 22 29 44.63 | 13.144 | 11 32 51.7 | 62.90 |
| 20 | 22 30 3.09 | 13.144 | 11 31 23.2 | 63.04 | 20 22 37.1 | 22 35 2.45 | 13.340 | 11 7 2.3 | 66.20 |
| 21 | 22 35 20.88 | 13.338 | 11 5 30.7 | 66.32 | 21 22 38.5 | 22 40 24.86 | 13.525 | 10 39 54.4 | 69.45 |
| 22 | 22 40 43.22 | 13.522 | 10 38 20.0 | 69.56 | 22 22 40.0 | 22 45 51.65 | 13.706 | 10 11 29.1 | 72.65 |
| 23 | 22 46 9.91 | 13.701 | 10 9 52.2 | 72.75 | 23 22 41.6 | 22 51 22.69 | 13.881 | 9 41 47.4 | 75.83 |
| 24 | 22 51 40.82 | 13.875 | 9 40 8.2 | 75.91 | 24 22 43.2 | 22 56 57.87 | 14.051 | 9 10 50.0 | 78.95 |
| 25 | 22 57 15.86 | 14.044 | 9 9 9.0 | 79.02 | 25 22 44.9 | 23 2 37.11 | 14.216 | 8 38 38.2 | 82.03 |
| 26 | 23 2 54.89 | 14.208 | 8 36 55.6 | 82.09 | 26 22 46.7 | 23 8 20.25 | 14.379 | 8 5 12.9 | 85.07 |
| 27 | 23 8 37.81 | 14.369 | 8 3 29.0 | 85.12 | 27 22 48.5 | 23 14 7.24 | 14.540 | 7 30 35.2 | 88.08 |
| 28 | 23 14 24.56 | 14.529 | 7 28 50.3 | 88.11 | 28 22 50.4 | 23 19 58.13 | 14.701 | 6 54 45.7 | 91.04 |
| 29 | 23 20 15.17 | 14.689 | 6 53 0.2 | 91.06 | 29 22 52.4 | 23 25 52.90 | 14.863 | 6 17 45.7 | 93.96 |
| 30 | 23 26 9.64 | 14.850 | 6 15 59.9 | 93.96 | 30 22 54.4 | 23 31 51.56 | 15.026 | 5 39 36.1 | 96.83 |
| 31 | 23 32 7.98 | 15.012 | 5 37 50.4 | 96.82 | 31 22 56.5 | 23 37 54.19 | 15.193 | 5 0 18.1 | 99.66 |
| Apr. 1 | 23 38 10.25 | 15.178 | 4 58 32.8 | 99.64 | 1 22 58.6 | 23 44 0.82 | 15.361 | 4 19 52.6 | 102.46 |
| 2 | 23 44 16.51 | 15.345 | 4 18 8.0 | 102.42 | 2 23 0.9 | 23 50 11 56 | 15.535 | 3 38 20.7 | 105.19 |
| 3 | 23 50 26.85 | 15.518 | 3 36 37.2 | 105.14 | 3 23 3.2 | 23 56 26.55 | 15.714 | 2 55 43.7 | 107.88 |
| 4 | 23 56 41.41 | 15.696 | 2 54 1.7 | 107.81 | 4 23 5.6 | 0 2 45.89 | 15.898 | 2 12 3.1 | 110.51 |
| 5 | 0 3 0.29 | 15.878 | 2 10 22.9 | 110.42 | 5 23 8.0 | 0 9 9.71 | 16.089 | 1 27 20.1 | 113.06 |
| 6 | 0 9 23.64 | 16.068 | 1 25 42.2 | 112.96 | 6 23 10.5 | 0 15 38.19 | 16.286 | - 0 41 36.3 | 115.57 |
| 7 | 0 15 51.60 | 16.264 | - 0 40 1.1 | 115.45 | 7 23 13.1 | 0 22 11.52 | 16.493 | + 0 5 6.7 | 117.99 |
| 8 | 0 22 24.38 | 16.469 | + 0 6 38.7 | 117.85 | 8 23 15.8 | 0 28 49.86 | 16.704 | 0 52 46.5 | 120.31 |
| 9 | 0 29 2.13 | 16.679 | 0 54 14.9 | 120.15 | 9 23 18.6 | 0 35 33.40 | 16.925 | 1 41 20.9 | 122.54 |
| 10 | 0 35 45.06 | 16.899 | 1 42 45.3 | 122.36 | 10 23 21.5 | 0 42 22.35 | 17.154 | 2 30 47.4 | 124.65 |
| 11 | 0 42 33.35 | 17.126 | 2 32 7.3 | 124.45 | 11 23 24.4 | 0 49 16.92 | 17.394 | 3 21 3.1 | 126.64 |
| 12 | 0 49 27.21 | 17.364 | 3 22 18.1 | 126.42 | 12 23 27.5 | 0 56 17.29 | 17.640 | 4 12 4.7 | 128.47 |
| 13 | 0 56 26.83 | 17.608 | 4 13 14.2 | 128.23 | 13 23 30.6 | 1 3 23.66 | 17.893 | 5 3 48.0 | 130.12 |
| 14 | 1 3 32.40 | 17.858 | 5 4 51.6 | 129.86 | 14 23 33.9 | 1 10 36.17 | 18.151 | 5 56 9.0 | 131.58 |
| 15 | 1 10 44.05 | 18.114 | 5 57 6.1 | 131.30 | 15 23 37.3 | 1 17 54.96 | 18.414 | 6 49 2.0 | 132.81 |
| 16 | 1 18 1.92 | 18.375 | 6 49 52.2 | 132.51 | 16 23 40.7 | 1 25 20.12 | 18.682 | 7 42 21.6 | 133.78 |
| 17 | 1 25 26.11 | 18.640 | 7 43 4.5 | 133.47 | 17 23 44.3 | 1 32 51.72 | 18.953 | 8 36 1.2 | 134.46 |
| 18 | 1 32 56.67 | 18.908 | 8 36 36.3 | 134.13 | 18 23 48.0 | 1 40 29.75 | 19.218 | 9 29 53.4 | 134.83 |
| 19 | 1 40 33.59 | 19.170 | 9 30 20.3 | 134.48 | 19 23 51.8 | 1 48 14.10 | 19.478 | 10 23 49.7 | 134.81 |
| 20 | 1 48 16.77 | 19.428 | 10 24 8.2 | 134.45 | 20 23 55.6 | 1 56 4.62 | 19.730 | 11 17 41.2 | 134.40 |
| 21 | 1 56 6.05 | 19.677 | 11 17 50.9 | 134.03 | 21 23 59.6 | 2 4 1.02 | 19.968 | 12 11 17.5 | 133.55 |
| 22 | 2 4 1.14 | 19.912 | 12 11 18.3 | 133.18 | 22 | | | | |
| 23 | 2 12 1.66 | 20.128 | 13 4 19.6 | 131.85 | 23 0 3.7 | 2 12 2.90 | 20.186 | 13 4 27.8 | 132.22 |
| 24 | 2 20 7.12 | 20.322 | 13 56 43.1 | 130.03 | 24 0 7.9 | 2 20 9.79 | 20.382 | 13 57 0.2 | 130.39 |
| 25 | 2 28 16.86 | 20.485 | 14 48 17.0 | 127.70 | 25 0 12.1 | 2 28 20.99 | 20.547 | 14 48 42.8 | 128.05 |
| 26 | 2 36 30.15 | 20.615 | 15 38 48.5 | 124.84 | 26 0 16.4 | 2 36 35.78 | 20.678 | 15 39 22.6 | 125.17 |
| 27 | 2 44 46.09 | 20.706 | 16 28 5.0 | 121.46 | 27 0 20.7 | 2 44 53.25 | 20.770 | 16 28 46.9 | 121.77 |
| 28 | 2 53 3.69 | 20.754 | 17 15 54.3 | 117.56 | 28 0 25.1 | 2 53 12.37 | 20.817 | 17 16 43.4 | 117.84 |
| 29 | 3 1 21.89 | 20.755 | 18 2 4.1 | 113.18 | 29 0 29.5 | 3 1 32.09 | 20.817 | 18 2 59.7 | 113.43 |
| 30 | 3 9 39.50 | 20.706 | 18 46 23.2 | 108.34 | 30 0 33.8 | 3 9 51.18 | 20.766 | 18 47 24.3 | 108.55 |
| 31 | 3 17 55.36 | 20.606 | +19 28 41.4 | +103.12 | 31 0 38.1 | 3 18 8.46 | 20.664 | +19 29 46.9 | +103.29 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| May 1 | 3 17 55.36 | 20.606 | +19 28 41.4 | +103.12 | 1 0 38.1 | 3 18 8.46 | 20.664 | +19 29 46.9 | +103.29 |
| 2 | 3 26 8.20 | 20.455 | 20 8 50.0 | 97.54 | 2 0 42.4 | 3 26 22.67 | 20.510 | 20 9 58.9 | 97.66 |
| 3 | 3 34 16.82 | 20.254 | 20 46 41.1 | 91.68 | 3 0 46.7 | 3 34 32.58 | 20.305 | 20 47 52.3 | 91.75 |
| 4 | 3 42 20.01 | 20.003 | 21 22 8.9 | 85.61 | 4 0 50.8 | 3 42 36.94 | 20.049 | 21 23 21.3 | 85.64 |
| 5 | 3 50 16.62 | 19.705 | 21 55 9.1 | 79.38 | 5 0 54.8 | 3 50 34.61 | 19.746 | 21 56 21.5 | 79.36 |
| 6 | 3 58 5.54 | 19.363 | 22 25 38.6 | 73.07 | 6 0 58.7 | 3 58 24.47 | 19.399 | 22 26 49.9 | 73.01 |
| 7 | 4 5 45.74 | 18.980 | 22 53 36.2 | 66.73 | 7 1 2.4 | 4 6 5.48 | 19.011 | 22 54 45.5 | 66.63 |
| 8 | 4 13 16.28 | 18.558 | 23 19 1.7 | 60.41 | 8 1 6.0 | 4 13 36.69 | 18.583 | 23 20 7.9 | 60.27 |
| 9 | 4 20 36.26 | 18.101 | 23 41 56.2 | 54.15 | 9 1 9.4 | 4 20 57.17 | 18.119 | 23 42 58.6 | 53.97 |
| 10 | 4 27 44.87 | 17.611 | 24 2 21.9 | 48.01 | 10 1 12.6 | 4 28 6.14 | 17.623 | 24 3 19.7 | 47.81 |
| 11 | 4 34 41.38 | 17.092 | 24 20 21.6 | 41.99 | 11 1 15.6 | 4 35 2.88 | 17.098 | 24 21 14.3 | 41.77 |
| 12 | 4 41 25.08 | 16.545 | 24 35 58.9 | 36.15 | 12 1 18.4 | 4 41 46.66 | 16.545 | 24 36 45.9 | 35.91 |
| 13 | 4 47 55.36 | 15.973 | 24 49 18.1 | 30.48 | 13 1 20.9 | 4 48 16.87 | 15.967 | 24 49 59.0 | 30.22 |
| 14 | 4 54 11.61 | 15.378 | 25 0 23.7 | 25.02 | 14 1 23.2 | 4 54 32.90 | 15.366 | 25 0 58.2 | 24.75 |
| 15 | 5 0 13.31 | 14.760 | 25 9 20.7 | 19.78 | 15 1 25.3 | 5 0 34.26 | 14.743 | 25 9 48.6 | 19.50 |
| 16 | 5 5 59.94 | 14.122 | 25 16 14.1 | 14.72 | 16 1 27.1 | 5 6 20.41 | 14.099 | 25 16 35.3 | 14.44 |
| 17 | 5 11 30.99 | 13.462 | 25 21 9.2 | 9.90 | 17 1 28.7 | 5 11 50.85 | 13.434 | 25 21 23.6 | 9 62 |
| 18 | 5 16 45.99 | 12.784 | 25 24 11.3 | 5.31 | 18 1 30.0 | 5 17 5.12 | 12.751 | 25 24 19.1 | 5.04 |
| 19 | 5 21 44.48 | 12.087 | 25 25 25.7 | + 0.93 | 19 1 31.0 | 5 22 2.76 | 12.050 | 25 25 26.9 | + 0.66 |
| 20 | 5 26 26.03 | 11.372 | 25 24 57.5 | − 3.24 | 20 1 31.7 | 5 26 43.37 | 11.331 | 25 24 52.3 | − 3.50 |
| 21 | 5 30 50.17 | 10.637 | 25 22 52.0 | 7.18 | 21 1 32.2 | 5 31 6.47 | 10.592 | 25 22 40.8 | 7.43 |
| 22 | 5 34 56.49 | 9.886 | 25 19 14.4 | 10.92 | 22 1 32.3 | 5 35 11.66 | 9.837 | 25 18 57.4 | 11.15 |
| 23 | 5 38 44.56 | 9.118 | 25 14 9.8 | 14.44 | 23 1 32.1 | 5 38 58.52 | 9.066 | 25 13 47.4 | 14.66 |
| 24 | 5 42 14.00 | 8.332 | 25 7 43.1 | 17.75 | 24 1 31.7 | 5 42 26.69 | 8.278 | 25 7 15.8 | 17.95 |
| 25 | 5 45 24.40 | 7.532 | 24 59 59.2 | 20.87 | 25 1 31.0 | 5 45 35.76 | 7.476 | 24 59 27.5 | 21.05 |
| 26 | 5 48 15.42 | 6.717 | 24 51 3.0 | 23.78 | 26 1 29.9 | 5 48 25.43 | 6.660 | 24 50 27.3 | 23.93 |
| 27 | 5 50 46.72 | 5.889 | 24 40 59.2 | 26.51 | 27 1 28.3 | 5 50 55.35 | 5.831 | 24 40 20.1 | 26.64 |
| 28 | 5 52 58.01 | 5.050 | 24 29 52.2 | 29.04 | 28 1 26.5 | 5 53 5.25 | 4.992 | 24 29 10.2 | 29.15 |
| 29 | 5 54 49.05 | 4.202 | 24 17 46.9 | 31.37 | 29 1 24.4 | 5 54 54.93 | 4.145 | 24 17 2.7 | 31.45 |
| 30 | 5 56 19.68 | 3.349 | 24 4 47.8 | 33.52 | 30 1 22.0 | 5 56 24.23 | 3.294 | 24 4 1.9 | 33.58 |
| 31 | 5 57 29.80 | 2 495 | 23 50 59.5 | 35.47 | 31 1 19.2 | 5 57 33.06 | 2.443 | 23 50 12.6 | 35.50 |
| June 1 | 5 58 19.44 | 1.642 | 23 36 26.8 | 37.22 | 1 1 16.1 | 5 58 21.49 | 1.594 | 23 35 39.5 | 37.22 |
| 2 | 5 58 48.71 | +0.799 | 23 21 14.5 | 38.77 | 2 1 12.6 | 5 58 49.66 | +0.755 | 23 20 27.6 | 38.75 |
| 3 | 5 58 57.90 | −0.030 | 23 5 27.4 | 40.12 | 3 1 8.8 | 5 58 57.85 | −0.069 | 23 4 41.4 | 40.07 |
| 4 | 5 58 47.42 | 0.838 | 22 49 10.7 | 41.23 | 4 1 4.7 | 5 58 46.50 | 0.872 | 22 48 26.3 | 41.15 |
| 5 | 5 58 17.90 | 1.617 | 22 32 30.2 | 42.12 | 5 1 0.3 | 5 58 16.26 | 1.644 | 22 31 47.9 | 42.02 |
| 6 | 5 57 30.10 | 2.359 | 22 15 31.1 | 42.76 | 6 0 55.5 | 5 57 27.91 | 2.379 | 22 14 51.5 | 42.64 |
| 7 | 5 56 25.04 | 3.055 | 21 58 19.6 | 43.14 | 7 0 50.5 | 5 56 22.46 | 3.067 | 21 57 43.3 | 43.00 |
| 8 | 5 55 3.91 | 3.696 | 21 41 2.5 | 43.24 | 8 0 45.2 | 5 55 1.12 | 3.701 | 21 40 29.9 | 43.08 |
| 9 | 5 53 28.16 | 4.272 | 21 23 46.6 | 43.03 | 9 0 39.7 | 5 53 25.34 | 4.270 | 21 23 18.1 | 42.85 |
| 10 | 5 51 39.44 | 4.776 | 21 6 39.5 | 42.51 | 10 0 34.0 | 5 51 36.74 | 4.768 | 21 6 15.5 | 42.32 |
| 11 | 5 49 39.57 | 5.200 | 20 49 48.8 | 41.66 | 11 0 28.1 | 5 49 37.14 | 5.186 | 20 49 29.3 | 41.47 |
| 12 | 5 47 30.55 | 5.536 | 20 33 22.4 | 40.48 | 12 0 22.0 | 5 47 28.52 | 5.517 | 20 33 7.6 | 40.29 |
| 13 | 5 45 14.59 | 5.778 | 20 17 28.4 | 38.95 | 13 0 15.8 | 5 45 13.07 | 5.755 | 20 17 18.2 | 38.77 |
| 14 | 5 42 53.96 | 5.924 | 20 2 15.7 | 37.03 | 14 0 9.5 | 5 42 53.02 | 5 899 | 20 2 9.8 | 36.86 |
| 15 | 5 40 31.04 | 5.969 | 19 47 53.8 | 34.74 | 15 0 3.2 | 5 40 30.72 | 5.943 | 19 47 51.9 | 34.59 |
| | | | | | 15 23 56.9 | 5 38 8.54 | 5.889 | 19 34 32.4 | 32.00 |
| 16 | 5 38 8.24 | 5.914 | 19 34 30.8 | 32.13 | 16 23 50.7 | 5 35 48.85 | 5.737 | 19 22 18.5 | 29.12 |
| 17 | 5 35 47.95 | 5.760 | 19 22 14.0 | 29.23 | 17 23 44.5 | 5 33 33.94 | 5.490 | 19 11 16.6 | 25.97 |
| 18 | 5 33 32.52 | 5.510 | 19 11 9.9 | 26.05 | 18 23 38.4 | 5 31 26.05 | 5.153 | 19 1 33.8 | 22.55 |
| 19 | 5 31 24.19 | 5.169 | 19 1 25.7 | 22.59 | 19 23 32.5 | 5 29 27.26 | 4.733 | 18 53 16.1 | 18.91 |
| 20 | 5 29 25.09 | 4.743 | 18 53 7.4 | 18.92 | 20 23 26.8 | 5 27 39.49 | 4.235 | 18 46 27.9 | 15.08 |
| 21 | 5 27 37.15 | 4.239 | 18 46 19.6 | 15.05 | 21 23 21.3 | 5 26 4.54 | 3.667 | 18 41 13.0 | 11.14 |
| 22 | 5 26 2.17 | 3.665 | 18 41 5.9 | 11.08 | 22 23 16.0 | 5 24 43.94 | 3.039 | 18 37 33.7 | 7.13 |
| 23 | 5 24 41.71 | 3.030 | 18 37 28.5 | 7.03 | 23 23 11.0 | 5 23 39.08 | 2.356 | 18 35 31.1 | − 3.08 |
| 24 | 5 23 37.16 | 2.340 | 18 35 28.6 | − 2.95 | 24 23 6.3 | 5 22 51.15 | 1.630 | 18 35 5.6 | + 0 96 |
| 25 | 5 22 49.70 | 1.607 | 18 35 6.6 | + 1.10 | 25 23 1.9 | 5 22 21.15 | 0.866 | 18 36 16.0 | 4.90 |
| 26 | 5 22 20.32 | 0.837 | 18 36 20.8 | 5.07 | 26 22 57.8 | 5 22 9.89 | −0.068 | 18 39 0.0 | 8.75 |
| 27 | 5 22 9.84 | −0.033 | 18 39 9.2 | 8.94 | 27 22 54.0 | 5 22 18.08 | +0.754 | 18 43 14.8 | 12.45 |
| 28 | 5 22 18.94 | +0.794 | 18 43 28.6 | 12.65 | 28 22 50:5 | 5 22 46.23 | 1.595 | 18 48 56.5 | 15.98 |
| 29 | 5 22 48.11 | 1.640 | 18 49 15.1 | 16.18 | 29 22 47.4 | 5 23 34.77 | 2.452 | 18 55 59.9 | 19.28 |
| 30 | 5 23 37.78 | +2.501 | +18 56 23.4 | +19.48 | 30 22 44.6 | 5 24 44.01 | +3.319 | +19 4 19.9 | +22.34 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ″ | ″ |
| July 1 | 5 24 48.22 | +3.371 | +19 4 48.1 | +22.53 | 1 22 42.2 | 5 26 14.15 | +4.194 | +19 13 50.0 | +25.12 |
| 2 | 5 26 19.63 | 4.248 | 19 14 22.7 | 25.30 | 2 22 40.1 | 5 28 5.33 | 5.072 | 19 24 23.3 | 27.61 |
| 3 | 5 28 12.13 | 5.128 | 19 25 0.2 | 27.78 | 3 22 38.4 | 5 30 17.64 | 5.954 | 19 35 52.9 | 29.79 |
| 4 | 5 30 25.79 | 6.011 | 19 36 33.6 | 29.94 | 4 22 37.0 | 5 32 51.13 | 6.837 | 19 48 10.7 | 31.64 |
| 5 | 5 33 0.64 | 6.894 | 19 48 54.6 | 31.76 | 5 22 35.9 | 5 35 45.81 | 7.720 | 20 1 8.6 | 33.13 |
| 6 | 5 35 56.68 | 7.776 | 20 1 55.1 | 33.22 | 6 22 35.2 | 5 39 1.67 | 8.601 | 20 14 37.8 | 34.24 |
| 7 | 5 39 13.86 | 8.655 | 20 15 26.2 | 34.30 | 7 22 34.9 | 5 42 38.64 | 9.480 | 20 28 29.0 | 34.97 |
| 8 | 5 42 52.11 | 9.532 | 20 29 18.6 | 35.00 | 8 22 34.9 | 5 46 36.65 | 10.355 | 20 42 33.0 | 35.29 |
| 9 | 5 46 51.36 | 10.405 | 20 43 23.0 | 35.29 | 9 22 35.3 | 5 50 55.62 | 11.226 | 20 56 39.5 | 35.18 |
| 10 | 5 51 11.50 | 11.273 | 20 57 29.1 | 35.15 | 10 22 36.0 | 5 55 35.45 | 12.091 | 21 10 38.2 | 34,64 |
| 11 | 5 55 52.40 | 12.134 | 21 11 26.6 | 34.57 | 11 22 37.1 | 6 0 35.93 | 12.948 | 21 24 18.4 | 33.64 |
| 12 | 6 0 53.85 | 12.986 | 21 25 4.8 | 33.54 | 12 22 38.5 | 6 5 56.89 | 13.797 | 21 37 29.0 | 32.16 |
| 13 | 6 6 15.65 | 13.829 | 21 38 12.6 | 32.03 | 13 22 40.2 | 6 11 38.07 | 14.632 | 21 49 58.4 | 30.20 |
| 14 | 6 11 57.53 | 14.658 | 21 50 38.4 | 30.04 | 14 22 42.3 | 6 17 39.11 | 15.453 | 22 1 34.8 | 27.74 |
| 15 | 6 17 59.12 | 15.472 | 22 2 10.5 | 27.55 | 15 22 44.7 | 6 23 59.60 | 16.252 | 22 12 6.1 | 24.78 |
| 16 | 6 24 20.00 | 16.264 | 22 12 37.0 | 24.57 | 16 22 47.4 | 6 30 39.03 | 17.028 | 22 21 20.1 | 21.30 |
| 17 | 6 30 59.61 | 17.032 | 22 21 45.7 | 21.07 | 17 22 50.4 | 6 37 36.71 | 17.772 | 22 29 4.4 | 17.31 |
| 18 | 6 37 57.29 | 17·768 | 22 29 24.3 | 17.07 | 18 22 53.7 | 6 44 51.81 | 18.480 | 22 35 7.3 | 12.84 |
| 19 | 6 45 12.19 | 18.467 | 22 35 21.3 | 12.59 | 19 22 57.3 | 6 52 23.39 | 19.143 | 22 39 16.9 | 7.88 |
| 20 | 6 52 43.34 | 19.121 | 22 39 25.0 | 7.64 | 20 23 01.1 | 7 0 10.26 | 19.754 | 22 41 22.4 | + 2.49 |
| 21 | 7 0 29.60 | 19.724 | 22 41 24.7 | + 2.26 | 21 23 5.1 | 7 8 11.12 | 20.308 | 22 41 13.5 | - 3.31 |
| 22 | 7 8 29.64 | 20.269 | 22 41 10.4 | - 3.53 | 22 23 9.5 | 7 16 24.54 | 20.798 | 22 38 41.4 | 9.43 |
| 23 | 7 16 42.02 | 20.751 | 22 38 33.4 | 9.62 | 23 23 13.9 | 7 24 48.85 | 21.215 | 22 33 38.8 | 15.83 |
| 24 | 7 25 5.10 | 21.160 | 22 33 26.6 | 15.99 | 24 23 18.5 | 7 33 22.25 | 21.556 | 22 25 59.6 | 22.45 |
| 25 | 7 33 37.12 | 21.495 | 22 25 44.1 | 22.57 | 25 23 23.2 | 7 42 2.92 | 21.820 | 22 15 40.3 | 29.18 |
| 26 | 7 42 16.26 | 21.754 | 22 15 22.4 | 29.25 | 26 23 28.0 | 7 50 49.00 | 22.005 | 22 2 39.0 | 35.92 |
| 27 | 7 51 0.69 | 21.935 | 22 2 19.9 | 35.95 | 27 23 32.9 | 7 59 38.55 | 22.111 | 21 46 56.2 | 42.62 |
| 28 | 7 59 48.51 | 22.038 | 21 46 37.0 | 42.61 | 28 23 37.8 | 8 8 29.73 | 22.141 | 21 28 33.9 | 49.21 |
| 29 | 8 8 37.90 | 22.066 | 21 28 15.7 | 49.14 | 29 23 42.7 | 8 17 20.78 | 22.101 | 21 7 36.0 | 55.58 |
| 30 | 8 17 27.13 | 22.025 | 21 7 20.0 | 55.46 | 30 23 47.6 | 8 26 10.06 | 21.995 | 20 44 8.5 | 61.66 |
| 31 | 8 26 14.60 | 21.920 | 20 43 55.7 | 61.51 | 31 23 52.4 | 8 34 56.07 | 21.831 | 20 18 18.0 | 67.47 |
| Aug. 1 | 8 34 58.84 | 21.758 | 20 18 9.4 | 67.26 | 1 23 57.1 | 8 43 37.52 | 21.615 | 19 50 12.8 | 72.90 |
| 2 | 8 43 38.56 | 21.544 | 19 50 9.3 | 72.67 | | | | | |
| 3 | 8 52 12.64 | 21.290 | 19 20 4.0 | 77.71 | 3 0 1.7 | 8 52 13.26 | 21.358 | 19 20 1.7 | 77.96 |
| 4 | 9 0 40.20 | 21.001 | 18 48 2.5 | 82.35 | 4 0 6.3 | 9 0 42.40 | 21.065 | 18 47 53.9 | 82.62 |
| 5 | 9 9 0.48 | 20.685 | 18 14 14.3 | 86.60 | 5 0 10.7 | 9 9 4.16 | 20.745 | 18 13 58.9 | 86.89 |
| 6 | 9 17 12.90 | 20.348 | 17 38 49.0 | 90.45 | 6 0 15.0 | 9 17 17.97 | 20.404 | 17 38 26.4 | 90.75 |
| 7 | 9 25 17.04 | 19.995 | 17 1 55.8 | 93.93 | 7 0 19.1 | 9 25 23.40 | 20.047 | 17 1 25.9 | 94.24 |
| 8 | 9 33 12.60 | 19.634 | 16 23 43.4 | 97.04 | 8 0 23.1 | 9 33 20.15 | 19.682 | 16 23 6.1 | 97.35 |
| 9 | 9 40 59.42 | 19.267 | 15 44 20.7 | 99.79 | 9 0 26.9 | 9 41 8.07 | 19.311 | 15 43 35.9 | 100.10 |
| 10 | 9 48 37.40 | 18.898 | 15 3 55.7 | 102.23 | 10 0 30.6 | 9 48 47.05 | 18.938 | 15 3 3.5 | 102.53 |
| 11 | 9 56 6.56 | 18.532 | 14 22 36.3 | 104.34 | 11 0 34.2 | 9 56 17.12 | 18.568 | 14 21 36.9 | 104.64 |
| 12 | 10 3 26.98 | 18.170 | 13 40 29.6 | 106.17 | 12 0 37.6 | 10 3 38.36 | 18.202 | 13 39 23.1 | 106.46 |
| 13 | 10 10 38.79 | 17.815 | 12 57 42.4 | 107.72 | 13 0 40.8 | 10 10 50.91 | 17.844 | 12 56 29.1 | 108.00 |
| 14 | 10 17 42.14 | 17.466 | 12 14 20.8 | 109.04 | 14 0 43.9 | 10 17 54.93 | 17.493 | 12 13 1.0 | 109.31 |
| 15 | 10 24 37.24 | 17.127 | 11 30 30.4 | 110.12 | 15 0 46.9 | 10 24 50.64 | 17.151 | 11 29 4.3 | 110.37 |
| 16 | 10 31 24.32 | 16.798 | 10 46 16.9 | 110.98 | 16 0 49.8 | 10 31 38.25 | 16.819 | 10 44 44.9 | 111.22 |
| 17 | 10 38 3.63 | 16.479 | 10 1 45.1 | 111.65 | 17 0 52.5 | 10 38 18.03 | 16.498 | 10 0 7.5 | 111.88 |
| 18 | 10 44 35.39 | 16.170 | 9 16 59.3 | 112.13 | 18 0 55.1 | 10 44 50.22 | 16.187 | 9 15 16.4 | 112.34 |
| 19 | 10 50 59.85 | 15.871 | 8 32 4.1 | 112.45 | 19 0 57.5 | 10 51 15.06 | 15.886 | 8 30 16.3 | 112.65 |
| 20 | 10 57 17.28 | 15.582 | 7 47 3.1 | 112.61 | 20 0 59.9 | 10 57 32.82 | 15.596 | 7 45 10.7 | 112.79 |
| 21 | 11 3 27.89 | 15.304 | 7 2 0.0 | 112.62 | 21 1 2.1 | 11 3 43.72 | 15.316 | 7 0 3.4 | 112.79 |
| 22 | 11 9 31.94 | 15.035 | 6 16 58.2 | 112.51 | 22 1 4.2 | 11 9 48.02 | 15.045 | 6 14 57.8 | 112.66 |
| 23 | 11 15 29.64 | 14.775 | 5 32 0.7 | 112.26 | 23 1 6.3 | 11 15 45.94 | 14.783 | 5 29 56.7 | 112.40 |
| 24 | 11 21 21.22 | 14.524 | 4 47 10.6 | 111.90 | 24 1 8.2 | 11 21 37.71 | 14.531 | 4 45 3.4 | 112.02 |
| 25 | 11 27 6.87 | 14.282 | 4 2 30.6 | 111.42 | 25 1 10.0 | 11 27 23.52 | 14.288 | 4 0 20.7 | 111.53 |
| 26 | 11 32 46.79 | 14.046 | 3 18 3.3 | 110.84 | 26 1 11.7 | 11 33 3.57 | 14.051 | 3 15 50.9 | 110.94 |
| 27 | 11 38 21.14 | 13.818 | 2 33 51.2 | 110.15 | 27 1 13.3 | 11 38 38.02 | 13.822 | 2 31 26.6 | 110.23 |
| 28 | 11 43 50.08 | 13.595 | 1 49 56.7 | 109.37 | 28 1 14.9 | 11 44 7.03 | 13.597 | 1 47 40.2 | 109.44 |
| 29 | 11 49 13.74 | 13.378 | 1 6 22.0 | 108.50 | 29 1 16.3 | 11 49 30.74 | 13.380 | 1 4 4.0 | 108.56 |
| 30 | 11 54 32.26 | 13.165 | + 0 23 9.4 | 107.54 | 30 1 17.7 | 11 54 49.29 | 13.166 | + 0 20 50.2 | 107.58 |
| 31 | 11 59 45 70 | 12.956 | - 0 19 39.0 | -106.48 | 31 1 19.0 | 12 0 2.74 | 12.956 | - 0 21 59.1 | 106.51 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | | | | | FOR MERIDIAN TRANSIT. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | | | Diff. for 1 hour. | Apparent Declination. | | | Diff. for 1 hour. | Mean Time of Transit. | | | Apparent Right Ascension. | | | Diff. for 1 h. of Long. | Apparent Declination. | | | Diff. for 1 hour of Long. |
| | h | m | s | s | ° | ′ | ″ | ″ | d | h | m | h | m | s | s | ° | ′ | ″ | ″ |
| Sept. 1 | 12 | 4 | 54.18 | 12.751 | − 1 | 2 | 1.1 | −105.34 | 1 | 1 | 20.2 | 12 | 5 | 11.20 | 12.750 | − 1 | 4 | 21.8 | −105.36 |
| 2 | 12 | 9 | 57.74 | 12.546 | 1 | 43 | 54.8 | 104.12 | 2 | 1 | 21.3 | 12 | 10 | 14.72 | 12.544 | 1 | 46 | 15.7 | 104.13 |
| 3 | 12 | 14 | 56.41 | 12.344 | 2 | 25 | 17.9 | 102.80 | 3 | 1 | 22.3 | 12 | 15 | 13.33 | 12.341 | 2 | 27 | 38.8 | 102.79 |
| 4 | 12 | 19 | 50.23 | 12.141 | 3 | 6 | 8.4 | 101.39 | 4 | 1 | 23.3 | 12 | 20 | 7.07 | 12.137 | 3 | 8 | 29.0 | 101.37 |
| 5 | 12 | 24 | 39.16 | 11.937 | 3 | 46 | 24.1 | 99.90 | 5 | 1 | 24.1 | 12 | 24 | 55.89 | 11.932 | 3 | 48 | 44.1 | 99.87 |
| 6 | 12 | 29 | 23.17 | 11.730 | 4 | 26 | 2.7 | 98.31 | 6 | 1 | 24.9 | 12 | 29 | 39.76 | 11.724 | 4 | 28 | 21.7 | 98.26 |
| 7 | 12 | 34 | 2.16 | 11.519 | 5 | 5 | 2.1 | 96.62 | 7 | 1 | 25.6 | 12 | 34 | 18.58 | 11.511 | 5 | 7 | 19.8 | 96.56 |
| 8 | 12 | 38 | 36.05 | 11.304 | 5 | 43 | 20.0 | 94.83 | 8 | 1 | 26.2 | 12 | 38 | 52.28 | 11.295 | 5 | 45 | 36.1 | 94.76 |
| 9 | 12 | 43 | 4.69 | 11.082 | 6 | 20 | 53.3 | 92.93 | 9 | 1 | 26.8 | 12 | 43 | 20.70 | 11.072 | 6 | 23 | 7.5 | 92.85 |
| 10 | 12 | 47 | 27.90 | 10.852 | 6 | 57 | 39.9 | 90.93 | 10 | 1 | 27.2 | 12 | 47 | 43.66 | 10.840 | 6 | 59 | 51.9 | 90.83 |
| 11 | 12 | 51 | 45.49 | 10.612 | 7 | 33 | 36.9 | 88.80 | 11 | 1 | 27.5 | 12 | 52 | 0.96 | 10.599 | 7 | 35 | 46.3 | 88.68 |
| 12 | 12 | 55 | 57.16 | 10.359 | 8 | 8 | 41.3 | 86.54 | 12 | 1 | 27.8 | 12 | 56 | 12.31 | 10.345 | 8 | 10 | 47.8 | 86.41 |
| 13 | 13 | 0 | 2.60 | 10.092 | 8 | 42 | 49.7 | 84.14 | 13 | 1 | 27.9 | 13 | 0 | 17.38 | 10.076 | 8 | 44 | 52.9 | 83.99 |
| 14 | 13 | 4 | 1.44 | 9.809 | 9 | 15 | 58.6 | 81.58 | 14 | 1 | 28.0 | 13 | 4 | 15.81 | 9.791 | 9 | 17 | 58.1 | 81.42 |
| 15 | 13 | 7 | 53.28 | 9.507 | 9 | 48 | 4.3 | 78.87 | 15 | 1 | 27.9 | 13 | 8 | 7.20 | 9.487 | 9 | 49 | 59.7 | 78.69 |
| 16 | 13 | 11 | 37.61 | 9.183 | 10 | 19 | 2.7 | 75.97 | 16 | 1 | 27.7 | 13 | 11 | 51.02 | 9.161 | 10 | 20 | 53.6 | 75.77 |
| 17 | 13 | 15 | 13.86 | 8.834 | 10 | 48 | 49.1 | 72.87 | 17 | 1 | 27.3 | 13 | 15 | 26.70 | 8.809 | 10 | 50 | 35.0 | 72.65 |
| 18 | 13 | 18 | 41.43 | 8.458 | 11 | 17 | 18.5 | 69.55 | 18 | 1 | 26.8 | 13 | 18 | 53.65 | 8.431 | 11 | 18 | 59.0 | 69.32 |
| 19 | 13 | 21 | 59.58 | 8.050 | 11 | 44 | 25.4 | 65.98 | 19 | 1 | 26.2 | 13 | 22 | 11.12 | 8.020 | 11 | 46 | 0.0 | 65.73 |
| 20 | 13 | 25 | 7.53 | 7.606 | 12 | 10 | 3.7 | 62.16 | 20 | 1 | 25.4 | 13 | 25 | 18.33 | 7.574 | 12 | 11 | 31.9 | 61.88 |
| 21 | 13 | 28 | 4.37 | 7.123 | 12 | 34 | 6.6 | 58.04 | 21 | 1 | 24.4 | 13 | 28 | 14.36 | 7.088 | 12 | 35 | 28.0 | 57.74 |
| 22 | 13 | 30 | 49.11 | 6.598 | 12 | 56 | 26.9 | 53.60 | 22 | 1 | 23.1 | 13 | 30 | 58.23 | 6.569 | 12 | 57 | 41.0 | 53.28 |
| 23 | 13 | 33 | 20.67 | 6.024 | 13 | 16 | 56.3 | 48.79 | 23 | 1 | 21.7 | 13 | 33 | 28.85 | 5.984 | 13 | 18 | 2.6 | 48.45 |
| 24 | 13 | 35 | 37.86 | 5.398 | 13 | 35 | 25.6 | 43.58 | 24 | 1 | 20.0 | 13 | 35 | 45.04 | 5.355 | 13 | 36 | 23.6 | 43.22 |
| 25 | 13 | 37 | 39.37 | 4.718 | 13 | 51 | 44.7 | 37.94 | 25 | 1 | 18.1 | 13 | 37 | 45.49 | 4.673 | 13 | 52 | 33.9 | 37.56 |
| 26 | 13 | 39 | 23.83 | 3.977 | 14 | 5 | 42.7 | 31.82 | 26 | 1 | 15.9 | 13 | 39 | 28.84 | 3.930 | 14 | 6 | 22.7 | 31.43 |
| 27 | 13 | 40 | 49.74 | 3 172 | 14 | 17 | 7.6 | 25.17 | 27 | 1 | 13.4 | 13 | 40 | 53.60 | 3.124 | 14 | 17 | 38.2 | 24.77 |
| 28 | 13 | 41 | 55.57 | 2.303 | 14 | 25 | 46.2 | 17.95 | 28 | 1 | 10.5 | 13 | 41 | 58.26 | 2.254 | 14 | 26 | 7.1 | 17.55 |
| 29 | 13 | 42 | 39.76 | 1.368 | 14 | 31 | 24.2 | 10.12 | 29 | 1 | 7.3 | 13 | 42 | 41.30 | 1.320 | 14 | 31 | 35.4 | 9.72 |
| 30 | 13 | 43 | 0.74 | +0.369 | 14 | 33 | 46.7 | − 1.65 | 30 | 1 | 3.7 | 13 | 43 | 1.11 | +0.323 | 14 | 33 | 48.3 | − 1.26 |
| Oct. 1 | 13 | 42 | 57.01 | −0.690 | 14 | 32 | 38.1 | + 7.48 | 1 | 0 | 59.7 | 13 | 42 | 56.30 | −0.733 | 14 | 32 | 30.5 | + 7.85 |
| 2 | 13 | 42 | 27.22 | 1.801 | 14 | 27 | 42.7 | 17.25 | 2 | 0 | 55.3 | 13 | 42 | 25.54 | 1.838 | 14 | 27 | 26.6 | 17.58 |
| 3 | 13 | 41 | 30.26 | 2.952 | 14 | 18 | 45.4 | 27.64 | 3 | 0 | 50.4 | 13 | 41 | 27.76 | 2.982 | 14 | 18 | 22.0 | 27.91 |
| 4 | 13 | 40 | 5.38 | 4.124 | 14 | 5 | 32.0 | 38.56 | 4 | 0 | 45.0 | 13 | 40 | 2.28 | 4.144 | 14 | 5 | 3.0 | 38.76 |
| 5 | 13 | 38 | 12.36 | 5.292 | 13 | 47 | 51.5 | 49.88 | 5 | 0 | 39.2 | 13 | 38 | 8.89 | 5.301 | 13 | 47 | 18.8 | 49.98 |
| 6 | 13 | 35 | 51.65 | 6.426 | 13 | 25 | 36.7 | 61.37 | 6 | 0 | 32.9 | 13 | 35 | 48.12 | 6.422 | 13 | 25 | 2.9 | 61.35 |
| 7 | 13 | 33 | 4.47 | 7.490 | 12 | 58 | 46.4 | 72.77 | 7 | 0 | 26.2 | 13 | 33 | 1.19 | 7.473 | 12 | 58 | 14.5 | 72.62 |
| 8 | 13 | 29 | 53.06 | 8.439 | 12 | 27 | 27.6 | 83.70 | 8 | 0 | 19.1 | 13 | 29 | 50.37 | 8.408 | 12 | 27 | 0.9 | 83.42 |
| 9 | 13 | 26 | 20.68 | 9.228 | 11 | 51 | 56.8 | 93.69 | 9 | 0 | 11.7 | 13 | 26 | 18.89 | 9.185 | 11 | 51 | 38.6 | 93.27 |
| 10 | 13 | 22 | 31.73 | 9.813 | 11 | 12 | 41.6 | 102.29 | 10 | 0 | 3.9 | 13 | 22 | 31.09 | 9.762 | 11 | 12 | 34.9 | 101.76 |
| | | | | | | | | | 10 | 23 | 56.0 | 13 | 18 | 32.28 | 10.096 | 10 | 30 | 20.4 | 108.35 |
| 11 | 13 | 18 | 31.61 | 10.152 | 10 | 30 | 22.2 | 108.96 | 11 | 23 | 48.1 | 13 | 14 | 28.70 | 10.157 | 9 | 46 | 12.2 | 112.62 |
| 12 | 13 | 14 | 26.67 | 10.212 | 9 | 45 | 49.8 | 113.28 | 12 | 23 | 40.1 | 13 | 10 | 27.13 | 9.926 | 9 | 0 | 44.5 | 114.23 |
| 13 | 13 | 10 | 23.82 | 9.974 | 9 | 0 | 6.4 | 114.85 | 13 | 23 | 32.3 | 13 | 6 | 34.68 | 9.398 | 8 | 15 | 12.8 | 112.92 |
| 14 | 13 | 6 | 30.32 | 9.434 | 8 | 14 | 20.5 | 113.46 | 14 | 23 | 24.8 | 13 | 2 | 58.32 | 8.587 | 7 | 30 | 47.8 | 108.68 |
| 15 | 13 | 2 | 53.26 | 8.607 | 7 | 29 | 43.8 | 109.09 | 15 | 23 | 17.7 | 12 | 59 | 44.57 | 7.519 | 6 | 48 | 38.6 | 101.64 |
| 16 | 12 | 59 | 39.25 | 7.520 | 6 | 47 | 26.7 | 101.87 | 16 | 23 | 11.0 | 12 | 56 | 59.11 | 6.237 | 6 | 9 | 49.0 | 92.13 |
| 17 | 12 | 56 | 54.01 | 6.217 | 6 | 8 | 33.7 | 92.17 | 17 | 23 | 4.8 | 12 | 54 | 46.55 | 4.786 | 5 | 35 | 12.9 | 80.55 |
| 18 | 12 | 54 | 42.17 | 4.747 | 5 | 33 | 59.0 | 80.40 | 18 | 22 | 59.3 | 12 | 53 | 10.29 | 3.221 | 5 | 5 | 34.5 | 67.44 |
| 19 | 12 | 53 | 7.06 | 3.165 | 5 | 4 | 26.6 | 67.10 | 19 | 22 | 54.4 | 12 | 52 | 12.40 | −1.596 | 4 | 41 | 23.9 | 53.31 |
| 20 | 12 | 52 | 10.70 | −1.526 | 4 | 40 | 26.2 | 52.82 | 20 | 22 | 50.2 | 12 | 51 | 53.77 | +0.042 | 4 | 22 | 59.0 | 38.71 |
| 21 | 12 | 51 | 53.87 | +0.121 | 4 | 22 | 14.7 | 38.10 | 21 | 22 | 46.6 | 12 | 52 | 14.18 | 1.650 | 4 | 10 | 26.2 | 24.05 |
| 22 | 12 | 52 | 16.25 | 1.734 | 4 | 9 | 57.6 | 23.37 | 22 | 22 | 43.6 | 12 | 53 | 12.46 | 3.195 | 4 | 3 | 41.3 | + 9.77 |
| 23 | 12 | 53 | 16.59 | 3.280 | 4 | 3 | 29.8 | + 9.05 | 23 | 22 | 41.3 | 12 | 54 | 46.78 | 4.648 | 4 | 2 | 31.8 | − 3.86 |
| 24 | 12 | 54 | 52.93 | 4.731 | 4 | 2 | 37.8 | − 4.58 | 24 | 22 | 39.4 | 12 | 56 | 54.70 | 5.994 | 4 | 6 | 39.0 | 16.58 |
| 25 | 12 | 57 | 2.80 | 6.072 | 4 | 7 | 2.2 | 17.28 | 25 | 22 | 38.1 | 12 | 59 | 33.50 | 7.221 | 4 | 15 | 39.7 | 28.29 |
| 26 | 12 | 59 | 43.42 | 7.293 | 4 | 16 | 19 2 | 28.94 | 26 | 22 | 37.3 | 13 | 2 | 40.33 | 8.329 | 4 | 29 | 8.0 | 38.87 |
| 27 | 13 | 2 | 51.88 | 8.391 | 4 | 30 | 2.4 | 39.45 | 27 | 22 | 36.9 | 13 | 6 | 12.31 | 9.315 | 4 | 46 | 36.6 | 48.32 |
| 28 | 13 | 6 | 25.24 | 9.368 | 4 | 47 | 44.2 | 48.83 | 28 | 22 | 36.9 | 13 | 10 | 6.53 | 10.185 | 5 | 7 | 38.1 | 56.62 |
| 29 | 13 | 10 | 20.65 | 10.230 | 5 | 8 | 57.1 | 57.06 | 29 | 22 | 37.2 | 13 | 14 | 20.31 | 10.947 | 5 | 31 | 45.7 | 63.84 |
| 30 | 13 | 14 | 35.43 | 10.985 | 5 | 33 | 14.3 | 64.20 | 30 | 22 | 37.7 | 13 | 18 | 51.18 | 11.610 | 5 | 59 | 34.1 | 70.02 |
| 31 | 13 | 19 | 7.12 | 11.640 | − 6 | 0 | 10.5 | −70.31 | 31 | 22 | 38.5 | 13 | 23 | 36.89 | 12.186 | − 6 | 27 | 39.3 | −75.25 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Nov. 1 | 13 23 53.46 | 12.208 | − 6 29 21.7 | −75.47 | 1 22 39.6 | 13 28 35.44 | 12.681 | − 6 58 39.2 | −79.59 |
| 2 | 13 28 52.45 | 12.696 | 7 0 26.1 | 79.75 | 2 22 40.8 | 13 33 45.01 | 13.106 | 7 31 13.7 | 83.15 |
| 3 | 13 34 2.32 | 13.116 | 7 33 3.6 | 83.25 | 3 22 42.2 | 13 39 4.08 | 13.472 | 8 5 4.7 | 85.99 |
| 4 | 13 39 21.55 | 13.477 | 8 6 56.3 | 86.04 | 4 22 43.7 | 13 44 31.27 | 13.786 | 8 39 56.1 | 88.19 |
| 5 | 13 44 48.80 | 13.786 | 8 41 48.3 | 88.19 | 5 22 45.3 | 13 50 5.44 | 14.055 | 9 15 33.3 | 89.81 |
| 6 | 13 50 22.93 | 14.052 | 9 17 25.1 | 89.78 | 6 22 47.0 | 13 55 45.65 | 14.289 | 9 51 43.5 | 90.96 |
| 7 | 13 56 3.02 | 14.282 | 9 53 34.1 | 90.89 | 7 22 48.8 | 14 1 31.05 | 14.490 | 10 28 15.7 | 91.66 |
| 8 | 14 1 48.22 | 14.480 | 10 30 4.3 | 91.56 | 8 22 50.7 | 14 7 20.95 | 14.665 | 11 4 59.7 | 91.95 |
| 9 | 14 7 37.87 | 14.653 | 11 6 45.7 | 91.83 | 9 22 52.7 | 14 13 14.78 | 14.818 | 11 41 46.6 | 91.91 |
| 10 | 14 13 31.40 | 14.804 | 11 43 29.6 | 91.77 | 10 22 54.7 | 14 19 12.07 | 14.953 | 12 18 28.8 | 91.56 |
| 11 | 14 19 28.34 | 14.938 | 12 20 8.3 | 91.41 | 11 22 56.7 | 14 25 12.46 | 15.075 | 12 54 59.4 | 90.95 |
| 12 | 14 25 28.34 | 15.058 | 12 56 35.2 | 90.79 | 12 22 58.8 | 14 31 15.60 | 15.185 | 13 31 12.6 | 90.10 |
| 13 | 14 31 31.06 | 15.167 | 13 32 44.3 | 89.93 | 13 23 1.0 | 14 37 21.26 | 15.285 | 14 7 2.8 | 89.06 |
| 14 | 14 37 36.28 | 14.266 | 14 8 30.3 | 88.88 | 14 23 3.2 | 14 43 29.24 | 15.379 | 14 42 25.8 | 87.82 |
| 15 | 14 43 43.79 | 15.359 | 14 43 48.8 | 87.63 | 15 23 5.4 | 14 49 39.40 | 15.467 | 15 17 16.7 | 86.41 |
| 16 | 14 49 53.46 | 15.446 | 15 18 35.2 | 86.22 | 16 23 7.6 | 14 55 51.60 | 15.550 | 15 51 32.3 | 84.86 |
| 17 | 14 56 5.15 | 15.528 | 15 52 46.2 | 84.67 | 17 23 9.9 | 15 2 5.75 | 15.629 | 16 25 8.9 | 83.17 |
| 18 | 15 2 18.78 | 15.607 | 16 26 18.2 | 82.98 | 18 23 12.2 | 15 8 21.80 | 15.708 | 16 58 3.8 | 81.37 |
| 19 | 15 8 34.28 | 15.685 | 16 59 8.4 | 81.18 | 19 23 14.6 | 15 14 39.70 | 15.784 | 17 30 13.8 | 79.44 |
| 20 | 15 14 51.63 | 15.761 | 17 31 13.8 | 79.25 | 20 23 17.0 | 15 20 59.44 | 15.860 | 18 1 36.6 | 77.43 |
| 21 | 15 21 10.80 | 15.836 | 18 2 32.0 | 77.24 | 21 23 19.4 | 15 27 21·00 | 15.936 | 18 32 10.1 | 75.34 |
| 22 | 15 27 31.77 | 15.911 | 18 33 1.0 | 75.15 | 22 23 21.8 | 15 33 44.35 | 16.011 | 19 1 51.9 | 73.13 |
| 23 | 15 33 54.52 | 15.986 | 19 2 38.3 | 72.95 | 23 23 24.3 | 15 40 9.53 | 16.087 | 19 30 39.8 | 70.86 |
| 24 | 15 40 19.09 | 16.061 | 19 31 21.9 | 70.68 | 24 23 26.8 | 15 46 36.52 | 16.163 | 19 58 32.3 | 68.50 |
| 25 | 15 46 45.46 | 16.137 | 19 59 10.1 | 68.33 | 25 23 29.3 | 15 53 5.35 | 16.240 | 20 25 27.4 | 66.07 |
| 26 | 15 53 13.65 | 16.213 | 20 26 1.1 | 65.90 | 26 23 31.9 | 15 59 36.04 | 16.317 | 20 51 23.1 | 63.57 |
| 27 | 15 59 43.68 | 16.289 | 20 51 52.8 | 63.41 | 27 23 34.5 | 16 6 8.59 | 16.395 | 21 16 18.2 | 61.01 |
| 28 | 16 6 15.56 | 16.367 | 21 16 44.1 | 60.85 | 28 23 37.1 | 16 12 43.02 | 16.474 | 21 40 10.9 | 58.37 |
| 29 | 16 12 49.30 | 16.445 | 21 40 33.1 | 58.22 | 29 23 39.7 | 16 19 19.34 | 16.554 | 22 2 59.7 | 55.68 |
| 30 | 16 19 24.92 | 16.524 | 22 3 18.4 | 55.54 | 30 23 42.4 | 16 25 57.58 | 16.632 | 22 24 42.9 | 52.91 |
| Dec. 1 | 16 26 2.44 | 16.602 | 22 24 58.3 | 52.78 | 1 23 45.1 | 16 32 37.70 | 16.712 | 22 45 19.3 | 50.09 |
| 2 | 16 32 41.83 | 16.681 | 22 45 31.6 | 49.97 | 2 23 47.9 | 16 39 19.73 | 16.791 | 23 4 47.0 | 47.20 |
| 3 | 16 39 23.11 | 16.759 | 23 4 56.5 | 47.09 | 3 23 50.7 | 16 46 3.65 | 16.869 | 23 23 4.8 | 44.26 |
| 4 | 16 46 6.27 | 16.837 | 23 23 11.7 | 44.16 | 4 23 53.5 | 16 52 49.44 | 16.947 | 23 40 11.2 | 41.26 |
| 5 | 16 52 51.28 | 16.914 | 23 40 15.7 | 41.16 | 5 23 56.3 | 16 59 37.08 | 17.023 | 23 56 4.7 | 38.19 |
| 6 | 16 59 38.12 | 16.989 | 23 56 7.0 | 38.11 | 6 23 59.2 | 17 6 26.53 | 17.097 | 24 10 43.8 | 35.06 |
| 7 | 17 6 26.75 | 17.063 | 24 10 44.3 | 34.99 | | | | | |
| 8 | 17 13 17.11 | 17.134 | 24 24 6.0 | 31.82 | 8 0 2.1 | 17 13 17.71 | 17.169 | 24 24 7.1 | 31.88 |
| 9 | 17 20 9.18 | 17.203 | 24 36 10.9 | 28.58 | 9 0 5.0 | 17 20 20.62 | 17.238 | 24 36 13.3 | 28.63 |
| 10 | 17 27 2.85 | 17.269 | 24 46 57.4 | 25.29 | 10 0 8.0 | 17 27 5.15 | 17.305 | 24 47 0.8 | 25.32 |
| 11 | 17 33 58.07 | 17.332 | 24 56 24.2 | 21.94 | 11 0 11.0 | 17 34 1.24 | 17.368 | 24 56 28.2 | 21.96 |
| 12 | 17 40 54.73 | 17.389 | 25 4 29.9 | 18.52 | 12 0 14.0 | 17 40 58.78 | 17.427 | 25 4 34.2 | 18.52 |
| 13 | 17 47 52.72 | 17.442 | 25 11 13.0 | 15.06 | 13 0 17.0 | 17 47 57.66 | 17.480 | 25 11 17.3 | 15.05 |
| 14 | 17 54 51.91 | 17.490 | 25 16 32.3 | 11.54 | 14 0 20.1 | 17 54 57.76 | 17.528 | 25 16 36.2 | 11.52 |
| 15 | 18 1 52.17 | 17.531 | 25 20 26.7 | 7.97 | 15 0 23.1 | 18 1 58.93 | 17.569 | 25 20 29.8 | 7.93 |
| 16 | 18 8 53.34 | 17.565 | 25 22 54.6 | 4.35 | 16 0 26.2 | 18 9 1.01 | 17.603 | 25 22 56.5 | 4.29 |
| 17 | 18 15 55.22 | 17.591 | 25 23 55.1 | − 0.68 | 17 0 29.3 | 18 16 3.81 | 17.629 | 25 23 55.4 | − 0.61 |
| 18 | 18 22 57.62 | 17.608 | 25 23 26.9 | + 3.04 | 18 0 32.4 | 18 23 7.13 | 17.646 | 25 23 25.3 | + 3.13 |
| 19 | 18 30 0.33 | 17.616 | 25 21 28.9 | 6.80 | 19 0 35.5 | 18 30 10.76 | 17.654 | 25 21 24.8 | 6.91 |
| 20 | 18 37 3.09 | 17.612 | 25 18 0.1 | 10.60 | 20 0 38.6 | 18 37 14.43 | 17.650 | 25 17 53.2 | 10.72 |
| 21 | 18 44 5.63 | 17.597 | 25 12 59.8 | 14.43 | 21 0 41.7 | 18 44 17.87 | 17.634 | 25 12 49.7 | 14.57 |
| 22 | 18 51 7.63 | 17.568 | 25 6 27.2 | 18.29 | 22 0 44.8 | 18 51 20.76 | 17.605 | 25 6 13.4 | 18.44 |
| 23 | 18 58 8.75 | 17.523 | 24 58 21.8 | 22.17 | 23 0 47.9 | 18 58 22.75 | 17.559 | 24 58 4.0 | 22.34 |
| 24 | 19 5 8.62 | 17.463 | 24 48 43.0 | 26.07 | 24 0 51.0 | 19 5 23.46 | 17.497 | 24 48 20.8 | 26.26 |
| 25 | 19 12 6.82 | 17.384 | 24 37 30.6 | 29.98 | 25 0 54.0 | 19 12 22.47 | 17.417 | 24 37 3.5 | 30.19 |
| 26 | 19 19 2.86 | 17.283 | 24 24 44.9 | 33.85 | 26 0 57.0 | 19 19 19.28 | 17.314 | 24 24 12.6 | 34.07 |
| 27 | 19 25 56.20 | 17.158 | 24 10 25.9 | 37.72 | 27 1 0.0 | 19 26 13.34 | 17.187 | 24 9 48.1 | 37.95 |
| 28 | 19 32 46.26 | 17.009 | 23 54 34.7 | 41.55 | 28 1 2.9 | 19 33 4.07 | 17.036 | 23 53 51.1 | 41.80 |
| 29 | 19 39 32.38 | 16.829 | 23 37 12.1 | 45.32 | 29 1 5.7 | 19 39 50.80 | 16.853 | 23 36 22.4 | 45.58 |
| 30 | 19 46 13.79 | 16.616 | 23 18 20.1 | 49.01 | 30 1 8.4 | 19 46 32.74 | 16.636 | 23 17 24.1 | 49.27 |
| 31 | 19 52 49.63 | 16.364 | 22 58 0.6 | 52.60 | 31 1 11.1 | 19 53 9.01 | 16.380 | 22 56 58.2 | 52.87 |
| 32 | 19 59 18.94 | 16.071 | −22 36 16.4 | −56.05 | 32 1 13.7 | 19 59 38.65 | 16.072 | −22 35 7.5 | +56.32 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Jan. 1 | 20 32 29.04 | 12.912 | −20 32 38.9 | +44.59 | 1 1 49.8 | 20 32 52.67 | 12.919 | −20 31 17.2 | +44.74 |
| 2 | 20 37 38.27 | 12.857 | 20 14 30.8 | 46.07 | 2 1 51.0 | 20 38 2.05 | 12.863 | 20 13 5.5 | 46.22 |
| 3 | 20 42 46.16 | 12.800 | 19 55 47.9 | 47.50 | 3 1 52.2 | 20 43 10.08 | 12.806 | 19 54 19.0 | 47.65 |
| 4 | 20 47 52.70 | 12.743 | 19 36 31.0 | 48.90 | 4 1 53.4 | 20 48 16.76 | 12.748 | 19 34 58.5 | 49.05 |
| 5 | 20 52 57.86 | 12.686 | 19 16 40.7 | 50.27 | 5 1 54.5 | 20 53 22.05 | 12.691 | 19 15 4.7 | 50.42 |
| 6 | 20 58 1.64 | 12.628 | 18 56 17.9 | 51.62 | 6 1 55.6 | 20 58 25.96 | 12.633 | 18 54 38.4 | 51.77 |
| 7 | 21 3 4.03 | 12.571 | 18 35 23.3 | 52.93 | 7 1 56.7 | 21 3 28.47 | 12.576 | 18 33 40.3 | 53.07 |
| 8 | 21 8 5.04 | 12.513 | 18 13 57.5 | 54.21 | 8 1 57.8 | 21 8 29.59 | 12.518 | 18 12 11.0 | 54.35 |
| 9 | 21 13 4.66 | 12.456 | 17 52 1.3 | 55.45 | 9 1 58.9 | 21 13 29.32 | 12.460 | 17 50 11.4 | 55.59 |
| 10 | 21 18 2.88 | 12.399 | 17 29 35.6 | 56.67 | 10 1 59.9 | 21 18 27.63 | 12.403 | 17 27 42.3 | 56.81 |
| 11 | 21 22 59.71 | 12.342 | 17 6 41.2 | 57.86 | 11 2 0.9 | 21 23 24.55 | 12.346 | 17 4 44.6 | 58.00 |
| 12 | 21 27 55.17 | 12.284 | 16 43 18.7 | 59.01 | 12 2 1.8 | 21 28 20.10 | 12.287 | 16 41 18.8 | 59.14 |
| 13 | 21 32 49.26 | 12.227 | 16 19 29.0 | 60.13 | 13 2 2.7 | 21 33 14.27 | 12.230 | 16 17 25.9 | 60.26 |
| 14 | 21 37 42.00 | 12.171 | 15 55 12.7 | 61.22 | 14 2 3.6 | 21 38 7.09 | 12.174 | 15 53 6.4 | 61.35 |
| 15 | 21 42 33.40 | 12.116 | 15 30 30.7 | 62.27 | 15 2 4.6 | 21 42 58.56 | 12.119 | 15 28 21.3 | 62.40 |
| 16 | 21 47 23.47 | 12.061 | 15 5 23.8 | 63.30 | 16 2 5.5 | 21 47 48.69 | 12.064 | 15 3 11.3 | 63.43 |
| 17 | 21 52 12.23 | 12.007 | 14 39 52.8 | 64.29 | 17 2 6.4 | 21 52 37.51 | 12.009 | 14 37 37.3 | 64.41 |
| 18 | 21 56 59.70 | 11.953 | 14 13 58.4 | 65.25 | 18 2 7.2 | 21 57 25.04 | 11.955 | 14 11 39.9 | 65.37 |
| 19 | 22 1 45.93 | 11.901 | 13 47 41.4 | 66.18 | 19 2 8.0 | 22 2 11.33 | 11.903 | 13 45 20.0 | 66.30 |
| 20 | 22 6 30.89 | 11.849 | 13 21 2.6 | 67.07 | 20 2 8.8 | 22 6 56.34 | 11.851 | 13 18 38.4 | 67.18 |
| 21 | 22 11 14.63 | 11.798 | 12 54 2.7 | 67.93 | 21 2 9.6 | 22 11 40.12 | 11.800 | 12 51 35.8 | 68.04 |
| 22 | 22 15 57.18 | 11.748 | 12 26 42.6 | 68.75 | 22 2 10.4 | 22 16 22.72 | 11.750 | 12 24 13.1 | 68.86 |
| 23 | 22 20 38.55 | 11.700 | 11 59 3.0 | 69.54 | 23 2 11.1 | 22 21 4.13 | 11.701 | 11 56 30.9 | 69.64 |
| 24 | 22 25 18.77 | 11.653 | 11 31 4.8 | 70.30 | 24 2 11.8 | 22 25 44.38 | 11.654 | 11 28 30.2 | 70.40 |
| 25 | 22 29 57.87 | 11.606 | 11 2 48.7 | 71.03 | 25 2 12.5 | 22 30 23.51 | 11.607 | 11 0 11.7 | 71.13 |
| 26 | 22 34 35.88 | 11.561 | 10 34 15.6 | 71.72 | 26 2 13.2 | 22 35 1.55 | 11.562 | 10 31 36.3 | 71.82 |
| 27 | 22 39 12.82 | 11.517 | 10 5 26.3 | 72.38 | 27 2 14.0 | 22 39 38.53 | 11.518 | 10 2 44.7 | 72.47 |
| 28 | 22 43 48.73 | 11.475 | 9 36 21.5 | 73.01 | 28 2 14.7 | 22 44 14.47 | 11.476 | 9 33 37.7 | 73.10 |
| 29 | 22 48 23.62 | 11.433 | 9 7 2.1 | 73.60 | 29 2 15.3 | 22 48 49.39 | 11.434 | 9 4 16.1 | 73.69 |
| 30 | 22 52 57.53 | 11.393 | 8 37 28.8 | 74.16 | 30 2 15.9 | 22 53 23.33 | 11.394 | 8 34 40.7 | 74.24 |
| 31 | 22 57 30.48 | 11.354 | 8 7 42.5 | 74.69 | 31 2 16.5 | 22 57 56.31 | 11.355 | 8 4 52.4 | 74.77 |
| Feb. 1 | 23 2 2.52 | 11.316 | 7 37 43.9 | 75.18 | 1 2 17.1 | 23 2 28.38 | 11.317 | 7 34 52.0 | 75.25 |
| 2 | 23 6 33.69 | 11.280 | 7 7 33.9 | 75.65 | 2 2 17.6 | 23 6 59.57 | 11.281 | 7 4 40.2 | 75.72 |
| 3 | 23 11 4.01 | 11.246 | 6 37 13.2 | 76.08 | 3 2 18.2 | 23 11 29.92 | 11.247 | 6 34 17.9 | 76.14 |
| 4 | 23 15 33.52 | 11.213 | 6 6 42.6 | 76.47 | 4 2 18.8 | 23 15 59.46 | 11.214 | 6 3 45.8 | 76.53 |
| 5 | 23 20 2.26 | 11.182 | 5 36 2.8 | 76.84 | 5 2 19.3 | 23 20 28.23 | 11.183 | 5 33 4.5 | 76.90 |
| 6 | 23 24 30.26 | 11.152 | 5 5 14.6 | 77.17 | 6 2 19.8 | 23 24 56.25 | 11.153 | 5 2 14.8 | 77.22 |
| 7 | 23 28 57.56 | 11.123 | 4 34 18.8 | 77.47 | 7 2 20.3 | 23 29 23.58 | 11.124 | 4 31 17.7 | 77.52 |
| 8 | 23 33 24.19 | 11.096 | 4 3 16.1 | 77.74 | 8 2 20.8 | 23 33 50.23 | 11.097 | 4 0 13.7 | 77.79 |
| 9 | 23 37 50.20 | 11.071 | 3 32 7.3 | 77.98 | 9 2 21.3 | 23 38 16.27 | 11.072 | 3 29 3.7 | 78.03 |
| 10 | 23 42 15.62 | 11.048 | 3 0 53.1 | 78.19 | 10 2 21.8 | 23 42 41.72 | 11.049 | 2 57 48.4 | 78.23 |
| 11 | 23 46 40.50 | 11.026 | 2 29 34.1 | 78.38 | 11 2 22.3 | 23 47 6.63 | 11.028 | 2 26 28.4 | 78.42 |
| 12 | 23 51 4.90 | 11.006 | 1 58 11.1 | 78.53 | 12 2 22.7 | 23 51 31.05 | 11.008 | 1 55 4.4 | 78.57 |
| 13 | 23 55 28.82 | 10.988 | 1 26 44.9 | 78.65 | 13 2 23.2 | 23 55 55.03 | 10.990 | 1 23 37.3 | 78.69 |
| 14 | 23 59 52.33 | 10.972 | 0 55 16.1 | 78.74 | 14 2 23.6 | 0 0 18.59 | 10.974 | 0 52 7.6 | 78.77 |
| 15 | 0 4 15.46 | 10.957 | − 0 23 45.6 | 78.80 | 15 2 24.1 | 0 4 41.76 | 10.959 | − 0 20 36.4 | 78.83 |
| 16 | 0 8 38.27 | 10.944 | + 0 7 46.1 | 78.83 | 16 2 24.5 | 0 9 4.62 | 10.946 | + 0 10 56.0 | 78.86 |
| 17 | 0 13 0.77 | 10.932 | 0 39 18.2 | 78.84 | 17 2 25.0 | 0 13 27.17 | 10.934 | 0 42 28.7 | 78.86 |
| 18 | 0 17 23.02 | 10.922 | 1 10 50.1 | 78.82 | 18 2 25.4 | 0 17 49.48 | 10.925 | 1 14 1.1 | 78.84 |
| 19 | 0 21 45.06 | 10.914 | 1 42 21.0 | 78.76 | 19 2 25.8 | 0 22 11.57 | 10·917 | 1 45 32.4 | 78.77 |
| 20 | 0 26 6.92 | 10.907 | 2 13 50.2 | 78.67 | 20 2 26.2 | 0 26 33.49 | 10.910 | 2 17 1.9 | 78.68 |
| 21 | 0 30 28.64 | 10.902 | 2 45 16.9 | 78.55 | 21 2 26.6 | 0 30 55.28 | 10.905 | 2 48 28.8 | 78.56 |
| 22 | 0 34 50.26 | 10.899 | 3 16 40.5 | 78.41 | 22 2 27.0 | 0 35 16.97 | 10.902 | 3 19 52.6 | 78.41 |
| 23 | 0 39 11.81 | 10.897 | 3 48 0.1 | 78.23 | 23 2 27.4 | 0 39 38.59 | 10.900 | 3 51 12.3 | 78.23 |
| 24 | 0 43 33.33 | 10.896 | 4 19 15.2 | 78.02 | 24 2 27.9 | 0 44 0.18 | 10.899 | 4 22 27.5 | 78.02 |
| 25 | 0 47 54.85 | 10.897 | 4 50 24.9 | 77.78 | 25 2 28.3 | 0 48 21.78 | 10.900 | 4 53 37.1 | 77.77 |
| 26 | 0 52 16.41 | 10.900 | 5 21 28.6 | 77.52 | 26 2 28.7 | 0 52 43.42 | 10.903 | 5 24 40.6 | 77.51 |
| 27 | 0 56 38.03 | 10.903 | 5 52 25.4 | 77.22 | 27 2 29.1 | 0 57 5.13 | 10.907 | 5 55 37.2 | 77.21 |
| 28 | 1 0 59.76 | 10.908 | 6 23 14.7 | 76.89 | 28 2 29.5 | 1 1 26.94 | 10.912 | 6 26 26.2 | 76.87 |
| 29 | 1 5 21.62 | 10.914 | 6 53 55.7 | 76.53 | 29 2 29.9 | 1 5 48.89 | 10.918 | 6 57 6.8 | 76.51 |
| 30 | 1 9 43.63 | 10.922 | 7 24 27.7 | 76.14 | 30 2 30.4 | 1 10 10.99 | 10.926 | 7 27 38.4 | 76.12 |
| 31 | 1 14 5.84 | 10.930 | + 7 54 50.0 | +75.72 | 31 2 30.8 | 1 14 33.30 | 10.935 | + 7 58 0.2 | +75.70 |

| Date. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1876. | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Mar. 1 | 1 9 43.63 | 10.922 | + 7 24 27.7 | +76.14 | 1 2 30.4 | 1 10 10.99 | 10.926 | + 7 27 38.4 | +76.12 |
| 2 | 1 14 5.84 | 10.930 | 7 54 50.0 | 75.72 | 2 2 30.8 | 1 14 33.30 | 10.935 | 7 58 0.2 | 75.70 |
| 3 | 1 18 28.26 | 10.940 | 8 25 1.8 | 75.27 | 3 2 31.3 | 1 18 55.83 | 10.945 | 8 28 11.4 | 75.24 |
| 4 | 1 22 50.93 | 10.950 | 8 55 2.5 | 74.79 | 4 2 31.7 | 1 23 18.61 | 10.955 | 8 58 11.4 | 74.76 |
| 5 | 1 27 13.87 | 10.962 | 9 24 51.3 | 74.28 | 5 2 32.2 | 1 27 41.66 | 10.967 | 9 27 59.5 | 74.25 |
| 6 | 1 31 37.12 | 10.975 | 9 54 27.4 | 73.74 | 6 2 32.7 | 1 32 5.03 | 10.980 | 9 57 34.8 | 73.70 |
| 7 | 1 36 0.69 | 10.989 | 10 23 50.3 | 73.17 | 7 2 33.1 | 1 36 28.72 | 10.994 | 10 26 56.8 | 73.13 |
| 8 | 1 40 24.61 | 11.004 | 10 52 59.2 | 72.57 | 8 2 33.6 | 1 40 52.76 | 11.009 | 10 56 4.7 | 72.53 |
| 9 | 1 44 48.92 | 11.021 | 11 21 53.5 | 71.95 | 9 2 34.0 | 1 45 17.19 | 11.026 | 11 24 58.0 | 71.90 |
| 10 | 1 49 13.62 | 11.038 | 11 50 32.5 | 71.29 | 10 2 34.5 | 1 49 42.02 | 11.044 | 11 53 35.9 | 71.24 |
| 11 | 1 53 38.76 | 11.057 | 12 18 55.4 | 70.61 | 11 2 34.9 | 1 54 7.30 | 11.063 | 12 21 57.6 | 70.55 |
| 12 | 1 58 4.34 | 11.076 | 12 47 1.5 | 69.90 | 12 2 35.4 | 1 58 33.00 | 11.082 | 12 50 2.4 | 69.84 |
| 13 | 2 2 30.40 | 11.096 | 13 14 50.3 | 69.16 | 13 2 36.0 | 2 2 59.23 | 11.102 | 13 17 49.9 | 69.10 |
| 14 | 2 6 56.95 | 11.117 | 13 42 21.2 | 68.40 | 14 2 36.5 | 2 7 25.93 | 11.123 | 13 45 19.4 | 68.34 |
| 15 | 2 11 24.02 | 11.139 | 14 9 33.4 | 67.61 | 15 2 36.9 | 2 11 53.15 | 11.145 | 14 12 30.1 | 67.54 |
| 16 | 2 15 51.62 | 11.162 | 14 36 26.3 | 66.79 | 16 2 37.4 | 2 15 20.90 | 11.168 | 14 39 21.4 | 66.72 |
| 17 | 2 20 19.77 | 11.185 | 15 2 59.3 | 65.95 | 17 2 37.9 | 2 20 49.20 | 11.192 | 15 5 52.8 | 65.88 |
| 18 | 2 24 48.48 | 11.208 | 15 29 11.7 | 65.08 | 18 2 38.4 | 2 25 18.07 | 11.215 | 15 32 3.4 | 65.00 |
| 19 | 2 29 17.77 | 11.232 | 15 55 2.7 | 64.17 | 19 2 39.0 | 2 29 47.52 | 11.239 | 15 57 52.6 | 64.09 |
| 20 | 2 33 47.64 | 11.257 | 16 20 31.7 | 63.24 | 20 2 39.6 | 2 34 17.56 | 11.264 | 16 23 19.7 | 63.16 |
| 21 | 2 38 18.10 | 11.281 | 16 45 38.1 | 62.29 | 21 2 40.1 | 2 38 48.20 | 11.288 | 16 48 24.2 | 62.20 |
| 22 | 2 42 49.15 | 11.306 | 17 10 21.2 | 61.30 | 22 2 40.7 | 2 43 19.43 | 11.313 | 17 13 5.3 | 61.21 |
| 23 | 2 47 20.80 | 11.331 | 17 34 40.4 | 60.29 | 23 2 41.3 | 2 47 51.26 | 11.338 | 17 37 22.4 | 60.20 |
| 24 | 2 51 53.03 | 11.356 | 17 58 35.0 | 59.25 | 24 2 41.9 | 2 52 23.67 | 11.364 | 18 1 14.8 | 59.15 |
| 25 | 2 56 25.85 | 11.380 | 18 22 4.4 | 58.19 | 25 2 42.6 | 2 56 56.67 | 11.388 | 18 24 41.9 | 58.09 |
| 26 | 3 0 59.26 | 11.404 | 18 45 8.1 | 57.10 | 26 2 43.2 | 3 1 30.26 | 11.412 | 18 47 43.2 | 57.00 |
| 27 | 3 5 33.24 | 11.427 | 19 7 45.2 | 55.98 | 27 2 43.8 | 3 6 4.42 | 11.435 | 19 10 17.8 | 55.88 |
| 28 | 3 10 7.76 | 11.450 | 19 29 55.2 | 54.84 | 28 2 44.4 | 3 10 39.13 | 11.458 | 19 32 25.3 | 54.73 |
| 29 | 3 14 42.83 | 11.472 | 19 51 37.5 | 53.67 | 29 2 45.1 | 3 15 14.38 | 11.480 | 19 54 5.0 | 53.56 |
| 30 | 3 19 18.41 | 11.493 | 20 12 51.5 | 52.48 | 30 2 45.7 | 3 19 50.14 | 11.501 | 20 15 16.2 | 52.36 |
| 31 | 3 23 54.48 | 11.513 | 20 33 36.5 | 51.27 | 31 2 46.3 | 3 24 26.39 | 11.521 | 20 35 58.4 | 51.15 |
| Apr. 1 | 3 28 31.02 | 11.532 | 20 53 52.1 | 50.03 | 1 2 47.0 | 3 29 3.11 | 11.539 | 20 56 11.1 | 49.91 |
| 2 | 3 33 8.01 | 11.549 | 21 13 37.7 | 48.77 | 2 2 47.7 | 3 33 40.28 | 11.556 | 21 15 53.7 | 48.64 |
| 3 | 3 37 45.41 | 11.566 | 21 32 52.8 | 47.48 | 3 2 48.4 | 3 38 17.86 | 11.573 | 21 35 5.8 | 47.35 |
| 4 | 3 42 23.18 | 11.581 | 21 51 36.8 | 46.18 | 4 2 49.0 | 3 42 55.80 | 11.588 | 21 53 46.7 | 46.05 |
| 5 | 3 47 1.29 | 11.595 | 22 9 49.3 | 44.86 | 5 2 49.7 | 3 47 34.09 | 11.602 | 22 11 56.0 | 44.72 |
| 6 | 3 51 39.72 | 11.607 | 22 27 29.8 | 43.51 | 6 2 50.4 | 3 52 12.69 | 11.614 | 22 29 33.2 | 43.37 |
| 7 | 3 56 18.42 | 11.617 | 22 44 37.9 | 42.15 | 7 2 51.1 | 3 56 51.55 | 11.624 | 22 46 37.9 | 42.01 |
| 8 | 4 0 57.34 | 11.626 | 23 1 13.0 | 40.77 | 8 2 51.8 | 4 1 30.63 | 11.632 | 23 3 9.6 | 40.62 |
| 9 | 4 5 36.45 | 11.633 | 23 17 14.8 | 39.38 | 9 2 52.5 | 4 6 9.89 | 11.639 | 23 19 7.8 | 39.23 |
| 10 | 4 10 15.69 | 11.637 | 23 32 42.9 | 37.97 | 10 2 53.3 | 4 10 49.28 | 11.643 | 23 34 32.3 | 37.82 |
| 11 | 4 14 55.01 | 11.640 | 23 47 37.1 | 36.54 | 11 2 54.0 | 4 15 28.71 | 11.646 | 23 49 22.8 | 36.39 |
| 12 | 4 19 34.38 | 11.641 | 24 1 56.8 | 35.10 | 12 2 54.7 | 4 20 8.25 | 11.647 | 24 3 38.8 | 34.94 |
| 13 | 4 24 13.75 | 11.640 | 24 15 41.9 | 33.65 | 13 2 55.4 | 4 24 47.76 | 11.645 | 24 17 20.1 | 33.49 |
| 14 | 4 28 53.05 | 11.635 | 24 28 52.0 | 32.19 | 14 2 56.1 | 4 29 27.19 | 11.640 | 24 30 26.3 | 32.02 |
| 15 | 4 33 32.23 | 11.629 | 24 41 26.9 | 30.72 | 15 2 56.8 | 4 34 6.49 | 11.634 | 24 42 57.2 | 30.55 |
| 16 | 4 38 11.20 | 11.620 | 24 53 26.3 | 29.23 | 16 2 57.5 | 4 38 45.58 | 11.624 | 24 54 52.5 | 29.06 |
| 17 | 4 42 49.94 | 11.609 | 25 4 50.0 | 27.74 | 17 2 58.2 | 4 43 24.42 | 11.613 | 25 6 12.1 | 27.57 |
| 18 | 4 47 28.36 | 11.594 | 25 15 37.8 | 26.24 | 18 2 58.9 | 4 48 2.93 | 11.597 | 25 16 55.7 | 26.07 |
| 19 | 4 52 6.39 | 11.576 | 25 25 49.6 | 24.74 | 19 2 59.6 | 4 52 41.04 | 11.579 | 25 27 3.3 | 24.56 |
| 20 | 4 56 43.96 | 11.556 | 25 35 25.1 | 23.23 | 20 3 0.3 | 4 57 18.69 | 11.558 | 25 36 34.6 | 23.05 |
| 21 | 5 1 20.99 | 11.532 | 25 44 24.3 | 21.71 | 21 3 1.0 | 5 1 55.78 | 11.534 | 25 45 29.5 | 21.53 |
| 22 | 5 5 57.39 | 11.504 | 25 52 47.1 | 20.19 | 22 3 1.6 | 5 6 32.22 | 11.505 | 25 53 47.9 | 20.01 |
| 23 | 5 10 33.09 | 11.472 | 26 0 33.4 | 18.67 | 23 3 2.3 | 5 11 7.94 | 11.472 | 26 1 29.8 | 18.49 |
| 24 | 5 15 7.99 | 11.437 | 26 7 43.1 | 17.14 | 24 3 2.9 | 5 15 42.85 | 11.437 | 26 8 35.0 | 16.96 |
| 25 | 5 19 42.01 | 11.398 | 26 14 16.4 | 15.62 | 25 3 3.6 | 5 20 16.87 | 11.397 | 26 15 3.8 | 15.44 |
| 26 | 5 24 15.04 | 11.354 | 26 20 13.1 | 14.10 | 26 3 4.2 | 5 24 49.88 | 11.353 | 26 20 56.0 | 13.92 |
| 27 | 5 28 46.98 | 11.307 | 26 25 33.5 | 12.59 | 27 3 4.8 | 5 29 21.79 | 11.305 | 26 26 11.9 | 12.41 |
| 28 | 5 33 17.74 | 11.256 | 26 30 17.5 | 11.08 | 28 3 5.4 | 5 33 52.50 | 11.253 | 26 30 51.4 | 10.90 |
| 20 | 5 37 47.21 | 11.200 | 26 34 25.4 | 9.58 | 29 3 5.9 | 5 38 21.90 | 11.196 | 26 34 54.8 | 9.39 |
| 30 | 5 42 15.29 | 11.140 | 26 37 57.3 | 8.08 | 30 3 6.4 | 5 42 49.89 | 11.135 | 26 38 22.1 | 7.89 |
| 31 | 5 46 41.87 | 11.075 | +26 40 53.3 | + 6.59 | 31 3 6.9 | 5 47 16.36 | 11.070 | +26 41 13.6 | + 6.40 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| May 1 | 5 46 41.87 | 11.075 | +26 40 53.3 | + 6.59 | 1 3 6.9 | 5 47 16.36 | 11.070 | +26 41 13.6 | + 6.40 |
| 2 | 5 51 6.84 | 11.006 | 26 43 13.9 | 5.12 | 2 3 7.4 | 5 51 41.20 | 11.000 | 26 43 29.6 | 4.93 |
| 3 | 5 55 30.08 | 10.932 | 26 44 59.3 | 3.66 | 3 3 7.8 | 5 56 4.29 | 10.925 | 26 45 10.5 | 3.48 |
| 4 | 5 59 51.50 | 10.853 | 26 46 9.8 | 2.22 | 4 3 8.2 | 6 0 25.53 | 10.845 | 26 46 16.5 | 2.04 |
| 5 | 6 4 10.98 | 10.770 | 26 46 45.8 | + 0.79 | 5 3 8.6 | 6 4 44.81 | 10.761 | 26 46 48.0 | + 0.61 |
| 6 | 6 8 28.41 | 10.682 | 26 46 47.6 | − 0.63 | 6 3 8.9 | 6 9 2.02 | 10.672 | 26 46 45.3 | − 0.81 |
| 7 | 6 12 43.68 | 10.590 | 26 46 15.6 | 2.03 | 7 3 9.2 | 6 13 17.06 | 10.579 | 26 46 8.9 | 2.21 |
| 8 | 6 16 56.69 | 10.493 | 26 45 10.4 | 3.41 | 8 3 9.5 | 6 17 29.81 | 10.481 | 26 44 59.3 | 3.59 |
| 9 | 6 21 7.31 | 10.392 | 26 43 32.5 | 4.76 | 9 3 9.7 | 6 21 40.15 | 10.379 | 26 43 17.1 | 4.93 |
| 10 | 6 25 15.44 | 10.286 | 26 41 22.3 | 6.09 | 10 3 9.9 | 6 25 47.98 | 10.272 | 26 41 2.7 | 6.26 |
| 11 | 6 29 20.95 | 10.175 | 26 38 40.5 | 7.39 | 11 3 10.0 | 6 29 53.16 | 10.160 | 26 38 16.8 | 7.56 |
| 12 | 6 33 23.75 | 10.059 | 26 35 27.5 | 8.67 | 12 3 10.1 | 6 33 55.61 | 10.043 | 26 34 59.7 | 8.83 |
| 13 | 6 37 23.72 | 9.939 | 26 31 43.9 | 9.93 | 13 3 10.2 | 6 37 55.20 | 9.922 | 26 31 12.1 | 10.09 |
| 14 | 6 41 20.74 | 9.814 | 26 27 30.4 | 11.17 | 14 3 10.2 | 6 41 51.82 | 9.796 | 26 26 54.7 | 11.33 |
| 15 | 6 45 14.70 | 9.684 | 26 22 47.6 | 12.38 | 15 3 10.2 | 6 45 45.36 | 9.665 | 26 22 8.1 | 12.53 |
| 16 | 6 49 5.47 | 9.548 | 26 17 36.2 | 13.56 | 16 3 10.1 | 6 49 35.68 | 9.528 | 26 16 53.1 | 13.71 |
| 17 | 6 52 52.94 | 9.408 | 26 11 56.9 | 14.71 | 17 3 9.9 | 6 53 22.68 | 9.387 | 26 11 10.2 | 14.86 |
| 18 | 6 56 36.98 | 9.263 | 26 5 50.4 | 15.82 | 18 3 9.7 | 6 57 6.23 | 9.241 | 26 5 0.2 | 15.96 |
| 19 | 7 0 17.45 | 9.112 | 25 59 17.5 | 16.91 | 19 3 9.4 | 7 0 46.18 | 9.089 | 25 58 23.9 | 17.04 |
| 20 | 7 3 54.23 | 8.955 | 25 52 18.9 | 17.97 | 20 3 9.1 | 7 4 22.42 | 8.931 | 25 51 22.1 | 18.10 |
| 21 | 7 7 27.18 | 8.792 | 25 44 55.4 | 18.99 | 21 3 8.7 | 7 7 54.80 | 8.767 | 25 44 55.5 | 19.11 |
| 22 | 7 10 56.16 | 8.624 | 25 37 7.8 | 19.97 | 22 3 8.2 | 7 11 23.18 | 8.598 | 25 36 4.9 | 20.09 |
| 23 | 7 14 21.02 | 8.449 | 25 28 57.0 | 20.92 | 23 3 7.7 | 7 14 47.41 | 8.422 | 25 27 51.3 | 21.03 |
| 24 | 7 17 41.61 | 8.268 | 25 20 23.9 | 21.83 | 24 3 7.1 | 7 18 7.34 | 8.240 | 25 19 15.6 | 21.93 |
| 25 | 7 20 57.78 | 8.080 | 25 11 29.5 | 22.70 | 25 3 6.4 | 7 21 22.83 | 8.051 | 25 10 18.8 | 22.79 |
| 26 | 7 24 9.38 | 7.886 | 25 2 14.7 | 23.53 | 26 3 5.7 | 7 24 33.73 | 7.856 | 25 1 1.8 | 23.62 |
| 27 | 7 27 16.23 | 7.685 | 24 52 40.3 | 24.32 | 27 3 4.8 | 7 27 39.85 | 7.654 | 24 51 25.3 | 24.40 |
| 28 | 7 30 18.18 | 7.477 | 24 42 47.4 | 25.07 | 28 3 3.9 | 7 30 41.05 | 7.445 | 24 41 30.5 | 25.14 |
| 29 | 7 33 15.04 | 7.261 | 24 32 36.9 | 25.78 | 29 3 2.9 | 7 33 37.13 | 7.227 | 24 31 18.3 | 25.84 |
| 30 | 7 36 6.64 | 7.037 | 24 22 10.1 | 26.45 | 30 3 1.8 | 7 36 27.92 | 7.002 | 24 20 50.0 | 26.52 |
| 31 | 7 38 52.78 | 6.806 | 24 11 27.8 | 27.08 | 31 3 0.6 | 7 39 13.22 | 6.770 | 24 10 6.3 | 27.13 |
| June 1 | 7 41 33.30 | 6.567 | 24 0 31.5 | 27.65 | 1 2 59.3 | 7 41 52.88 | 6.530 | 23 59 8.8 | 27.69 |
| 2 | 7 44 8.00 | 6.322 | 23 49 21.7 | 28.17 | 2 2 57.9 | 7 44 26.70 | 6.284 | 23 47 58.0 | 28.20 |
| 3 | 7 46 36.71 | 6.069 | 23 37 59.8 | 28.65 | 3 2 56.4 | 7 46 54.51 | 6.031 | 23 36 35.4 | 28.67 |
| 4 | 7 48 59.20 | 5.807 | 23 26 26.9 | 29.08 | 4 2 54.8 | 7 49 16.08 | 5.768 | 23 25 2.0 | 29.09 |
| 5 | 7 51 15.31 | 5.536 | 23 14 44.1 | 29.47 | 5 2 53.1 | 7 51 31.24 | 5.496 | 23 13 19.0 | 27.47 |
| 6 | 7 53 24.83 | 5.257 | 23 2 52.4 | 29.82 | 6 2 51.3 | 7 53 39.80 | 5.216 | 23 1 27.2 | 29.81 |
| 7 | 7 55 27.58 | 4.970 | 22 50 53.0 | 30.12 | 7 2 49.4 | 7 55 41.57 | 4.929 | 22 49 27.9 | 30.10 |
| 8 | 7 57 23.33 | 4.674 | 22 38 47.0 | 30.37 | 8 2 47.5 | 7 57 36.33 | 4.632 | 22 37 22.3 | 30.35 |
| 9 | 7 59 11.90 | 4.371 | 22 26 35.5 | 30.58 | 9 2 45.3 | 7 59 23.89 | 4.329 | 22 25 11.3 | 30.55 |
| 10 | 8 0 53.05 | 4.058 | 22 14 19.6 | 30.74 | 10 2 43.1 | 8 1 4.02 | 4.015 | 22 12 56.1 | 30.70 |
| 11 | 8 2 26.60 | 3.735 | 22 2 0.5 | 30.85 | 11 2 40.7 | 8 2 36.55 | 3.692 | 22 0 37.9 | 30.80 |
| 12 | 8 3 52.34 | 3.404 | 21 49 39.3 | 30.91 | 12 2 38.2 | 8 4 1.26 | 3.361 | 21 48 17.8 | 30.86 |
| 13 | 8 5 10.06 | 3.066 | 21 37 17.0 | 30.93 | 13 2 35.5 | 8 5 17.95 | 3.023 | 21 35 56.8 | 30.87 |
| 14 | 8 6 19.52 | 2.717 | 21 24 54.8 | 30.91 | 14 2 32.7 | 8 6 26.39 | 2.675 | 21 23 36.1 | 30.84 |
| 15 | 8 7 20.54 | 2.361 | 21 12 33.7 | 30.84 | 15 2 29.8 | 8 7 26.39 | 2.319 | 21 11 16.7 | 30.76 |
| 16 | 8 8 12.89 | 1.996 | 21 0 14.9 | 30.72 | 16 2 26.7 | 8 8 17.73 | 1.955 | 20 58 59.8 | 30.63 |
| 17 | 8 8 56.38 | 1.622 | 20 47 59.4 | 30.56 | 17 2 23.5 | 8 9 0.22 | 1.581 | 20 46 46.4 | 30.47 |
| 18 | 8 9 30.80 | 1.240 | 20 35 48.2 | 30.36 | 18 2 20.1 | 8 9 33.66 | 1.200 | 20 34 37.4 | 30.26 |
| 19 | 8 9 55.97 | 0.851 | 20 23 42.5 | 30.11 | 19 2 16.6 | 8 9 57.87 | 0.812 | 20 22 34.0 | 30.01 |
| 20 | 8 10 11.70 | 0.455 | 20 11 43.3 | 29.82 | 20 2 12.9 | 8 10 12.67 | 0.417 | 20 10 37.3 | 29.71 |
| 21 | 8 10 17.84 | +0.052 | 19 59 51.6 | 29.49 | 21 2 9.0 | 8 10 17.91 | +0.016 | 19 58 48.2 | 29.38 |
| 22 | 8 10 14.21 | −0.356 | 19 48 8.4 | 29.11 | 22 2 5.0 | 8 10 13.43 | −0.390 | 19 47 7.8 | 28.99 |
| 23 | 8 10 0.72 | 0.770 | 19 36 34.8 | 28.68 | 23 2 0.8 | 8 9 59.14 | 0.802 | 19 35 37.0 | 28.56 |
| 24 | 8 9 37.22 | 1.189 | 19 25 11.8 | 28.22 | 24 1 56.5 | 8 9 34.88 | 1.219 | 19 24 17.0 | 28.09 |
| 25 | 8 9 3.66 | 1.610 | 19 14 0.4 | 27.72 | 25 1 52.0 | 8 9 0.62 | 1.637 | 19 13 8.6 | 27.59 |
| 26 | 8 8 19.98 | 2.031 | 19 3 1.2 | 27.19 | 26 1 47.3 | 8 8 16.31 | 2.055 | 19 2 12.5 | 27.06 |
| 27 | 8 7 26.22 | 2.450 | 18 52 15.5 | 26.61 | 27 1 42.5 | 8 7 22.00 | 2.471 | 18 51 30.0 | 26.48 |
| 28 | 8 6 22.42 | 2.865 | 18 41 44.0 | 26.00 | 28 1 37.5 | 8 6 17.74 | 2.883 | 18 41 1.7 | 25.86 |
| 29 | 8 5 8.71 | 3.275 | 18 31 27.5 | 25.37 | 29 1 32.3 | 8 5 3.65 | 3.289 | 18 30 48.5 | 25.24 |
| 30 | 8 3 45.27 | 3.677 | 18 21 26.9 | 24.70 | 30 1 27.0 | 8 3 39.92 | 3.687 | 18 20 51.1 | 24.57 |
| 31 | 8 2 12.34 | −4.067 | +18 11 42.7 | −24.00 | 31 1 21.5 | 8 2 6.79 | −4.073 | +18 11 10.1 | −23.87 |

| Date. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1876. | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| July 1 | 8 2 12.34 | –4.067 | +18 11 42.7 | –24.00 | 1 1 21.5 | 8 2 6 79 | –4.073 | +18 11 10.1 | –23.87 |
| 2 | 8 0 30.24 | 4.441 | 18 2 15.4 | 23.27 | 2 1 15.9 | 8 0 24.60 | 4.443 | 18 1 46.0 | 23.14 |
| 3 | 7 58 39.35 | 4.798 | 17 53 5.7 | 22.52 | 3 1 10.1 | 7 58 33.72 | 4.795 | 17 52 39.4 | 22.39 |
| 4 | 7 56 40.14 | 5.134 | 17 44 14.2 | 21.75 | 4 1 4.2 | 7 56 34.63 | 5.127 | 17 43 50.9 | 21.63 |
| 5 | 7 54 33.15 | 5.445 | 17 35 41.6 | 20.96 | 5 0 58.2 | 7 54 27.86 | 5.434 | 17 35 21.3 | 20.84 |
| 6 | 7 52 19.01 | 5.729 | 17 27 28.3 | 20.15 | 6 0 52.0 | 7 52 14.04 | 5.714 | 17 27 10.9 | 20.04 |
| 7 | 7 49 58.43 | 5.982 | 17 19 34.7 | 19.31 | 7 0 45.8 | 7 49 53.87 | 5.964 | 17 19 20.0 | 19.20 |
| 8 | 7 47 32.16 | 6.202 | 17 12 1.4 | 18.46 | 8 0 39.4 | 7 47 28.09 | 6.181 | 17 11 49.3 | 18.36 |
| 9 | 7 45 1.01 | 6.387 | 17 4 48.6 | 17.59 | 9 0 33.0 | 7 44 57.50 | 6.362 | 17 4 38.9 | 17.49 |
| 10 | 7 42 25.89 | 6.533 | 16 57 56.6 | 16.71 | 10 0 26.5 | 7 42 23.02 | 6.506 | 16 57 49.2 | 16.62 |
| 11 | 7 39 47.74 | 6.639 | 16 51 26.1 | 15.81 | 11 0 19.9 | 7 39 45.55 | 6.610 | 16 51 20.9 | 15.73 |
| 12 | 7 37 7.51 | 6.706 | 16 45 17.4 | 14.90 | 12 0 13.3 | 7 37 6.03 | 6.676 | 16 45 14.1 | 14.83 |
| 13 | 7 34 26.18 | 6.729 | 16 39 30.9 | 13.97 | 13 0 6.7 | 7 34 25.43 | 6.698 | 16 39 29.3 | 13.91 |
| 14 | 7 31 44.76 | 6.713 | 16 34 6.8 | 13.03 | 14 0 0.1 | 7 31 44.75 | 6.682 | 16 34 6.7 | 12.97 |
| | | | | | 14 23 53.5 | 7 29 4.97 | 6.625 | 16 29 7.0 | 12.02 |
| 15 | 7 29 4.25 | 6.655 | 16 29 5.7 | 12.07 | 15 23 47.0 | 7 26 27.04 | 6.528 | 16 24 30.3 | 11.06 |
| 16 | 7 26 25.61 | 6.557 | 16 24 27.9 | 11.10 | 16 23 40.5 | 7 23 51.90 | 6.392 | 16 20 16.9 | 10.08 |
| 17 | 7 23 49.80 | 6.419 | 16 20 13.6 | 10.11 | 17 23 34.1 | 7 21 20.45 | 6.221 | 16 16 26.9 | 9.09 |
| 18 | 7 21 17.74 | 6.245 | 16 16 22.9 | 9.11 | 18 23 27.7 | 7 18 53.54 | 6.015 | 16 13 0.7 | 8.10 |
| 19 | 7 18 50.28 | 6.036 | 16 12 56.3 | 8.11 | 19 23 21.4 | 7 16 31.96 | 5.776 | 16 9 58.3 | 7.10 |
| 20 | 7 16 28.23 | 5.794 | 16 9 53.7 | 7.10 | 20 23 15.2 | 7 14 16.50 | 5.507 | 16 7 19.9 | 6.11 |
| 21 | 7 14 12.38 | 5.522 | 16 7 15.3 | 6.10 | 21 23 9.2 | 7 12 7.83 | 5.211 | 16 5 5.2 | 5.12 |
| 22 | 7 12 3.40 | 5.222 | 16 5 0.9 | 5.10 | 22 23 3.2 | 7 10 6.54 | 4.892 | 16 3 14.4 | 4.14 |
| 23 | 7 10 1.89 | 4.899 | 16 3 10.5 | 4.11 | 23 22 57.4 | 7 8 13.16 | 4.551 | 16 1 46.7 | 3.17 |
| 24 | 7 8 8.40 | 4.554 | 16 1 43.4 | 3.14 | 24 22 51.7 | 7 6 28.20 | 4.190 | 16 0 42.2 | 2.22 |
| 25 | 7 6 23.42 | 4.189 | 16 0 39.7 | 2.18 | 25 22 46.2 | 7 4 52.05 | 3.815 | 16 0 0.2 | 1.30 |
| 26 | 7 4 47.34 | 3.810 | 15 59 58.6 | 1.25 | 26 22 40.8 | 7 3 25.07 | 3.428 | 15 59 40.2 | – 0.40 |
| 27 | 7 3 20.53 | 3.419 | 15 59 39.7 | – 0.35 | 27 22 35.6 | 7 2 7.52 | 3.031 | 15 59 41.2 | + 0.47 |
| 28 | 7 2 3.25 | 3.018 | 15 59 41.8 | + 0.52 | 28 22 30.5 | 7 0 59.60 | 2.626 | 16 0 2.5 | 1.29 |
| 29 | 7 0 55.69 | 2.609 | 16 0 4.5 | 1.35 | 29 22 25.6 | 7 0 1.49 | 2.215 | 16 0 43.1 | 2.07 |
| 30 | 6 59 58.02 | 2.195 | 16 0 46.4 | 2.13 | 30 22 20.8 | 6 59 13.26 | 1.801 | 16 1 42.0 | 2.81 |
| 31 | 6 59 10.30 | 1.778 | 16 1 46.7 | 2.87 | 31 22 16.3 | 6 58 35.01 | 1.385 | 16 2 57.9 | 3.50 |
| Aug. 1 | 6 58 32.63 | 1.360 | 16 3 4.0 | 3.56 | 1 22 11.9 | 6 58 6.74 | 0.970 | 16 4 29.7 | 4.13 |
| 2 | 6 58 5.01 | 0.942 | 16 4 37.2 | 4.19 | 2 22 7.7 | 6 57 48.39 | 0.557 | 16 6 15.9 | 4.71 |
| 3 | 6 57 47.37 | 0.527 | 16 6 24.8 | 4.76 | 3 22 3.6 | 6 57 39.93 | –0.148 | 16 8 15.1 | 5.22 |
| 4 | 6 57 39.67 | –0.116 | 16 8 25.3 | 5.27 | 4 21 59.7 | 6 57 41.23 | +0.256 | 16 10 25.9 | 5.67 |
| 5 | 6 57 41.78 | +0.290 | 16 10 37.3 | 5.72 | 5 21 55.9 | 6 57 52.16 | 0.655 | 16 12 46.8 | 6.06 |
| 6 | 6 57 53.55 | 0.690 | 16 12 59.4 | 6.11 | 6 21 52.3 | 6 58 12.56 | 1.045 | 16 15 16.2 | 6.39 |
| 7 | 6 58 14.82 | 1.082 | 16 15 29.9 | 6.43 | 7 21 48.9 | 6 58 42.26 | 1.429 | 16 17 52.8 | 6.66 |
| 8 | 6 58 45.42 | 1.467 | 16 18 7.4 | 6.69 | 8 21 45.6 | 6 59 21.06 | 1.803 | 16 20 34.9 | 6.85 |
| 9 | 6 59 25.14 | 1.842 | 16 20 50.3 | 6.88 | 9 21 42.5 | 7 0 8.74 | 2.168 | 16 23 21.0 | 6.99 |
| 10 | 7 0 13.76 | 2.207 | 16 23 37.1 | 7.01 | 10 21 39.5 | 7 1 5.07 | 2.524 | 16 26 9.7 | 7.07 |
| 11 | 7 1 11.04 | 2.563 | 16 26 26.3 | 7.08 | 11 21 36.6 | 7 2 9.82 | 2.869 | 16 28 59.4 | 7.07 |
| 12 | 7 2 16.73 | 2.908 | 16 29 16.3 | 7.08 | 12 21 33.9 | 7 3 22.73 | 3.204 | 16 31 48.7 | 7.02 |
| 13 | 7 3 30.59 | 3.243 | 16 32 5.8 | 7.02 | 13 21 31.3 | 7 4 43.55 | 3.529 | 16 34 35.9 | 6.91 |
| 14 | 7 4 52.35 | 3.567 | 16 34 53.0 | 6.91 | 14 21 28.8 | 7 6 12.02 | 3.843 | 16 37 20.0 | 6.74 |
| 15 | 7 6 21.76 | 3.881 | 16 37 37.0 | 6.74 | 15 21 26.6 | 7 7 47.91 | 4.146 | 16 39 59.5 | 6.53 |
| 16 | 7 7 58.57 | 4.184 | 16 40 16.2 | 6.51 | 16 21 24.4 | 7 9 30.96 | 4.439 | 16 42 33.1 | 6.26 |
| 17 | 7 9 42.53 | 4.476 | 16 42 49.3 | 6.23 | 17 21 22.2 | 7 11 20.89 | 4.721 | 16 44 59.2 | 5.92 |
| 18 | 7 11 33.36 | 4.758 | 16 45 14.7 | 5.89 | 18 21 20.2 | 7 13 17.49 | 4.994 | 16 47 17.0 | 5.55 |
| 19 | 7 13 30.84 | 5.030 | 16 47 31.7 | 5.51 | 19 21 18.3 | 7 15 20.50 | 5.257 | 16 49 25.3 | 5.13 |
| 20 | 7 15 34.72 | 5.292 | 16 49 39.0 | 5.08 | 20 21 16.5 | 7 17 29.73 | 5.509 | 16 51 22.8 | 4.65 |
| 21 | 7 17 44.79 | 5.544 | 16 51 35.3 | 4.60 | 21 21 14.8 | 7 19 44.90 | 5.753 | 16 53 8.4 | 4.13 |
| 22 | 7 20 0.79 | 5.787 | 16 53 19.6 | 4.07 | 22 21 13.2 | 7 22 5.81 | 5.988 | 16 54 40.7 | 3.57 |
| 23 | 7 22 22.51 | 6.021 | 16 54 50.5 | 3.50 | 23 21 11.7 | 7 24 32.26 | 6.214 | 16 55 59.1 | 2.96 |
| 24 | 7 24 49.74 | 6.248 | 16 56 7.3 | 2.89 | 24 21 10.3 | 7 27 4.04 | 6.432 | 16 57 2.6 | 2.32 |
| 25 | 7 27 22.28 | 6.463 | 16 57 9.0 | 2.24 | 25 21 9.0 | 7 29 40.93 | 6.641 | 16 57 50.0 | 1.63 |
| 26 | 7 29 59.91 | 6.671 | 16 57 54.5 | 1.54 | 26 21 7.8 | 7 32 22.76 | 6.843 | 16 58 20.5 | 0.90 |
| 27 | 7 32 42.46 | 6.872 | 16 58 22.9 | 0.81 | 27 21 6.6 | 7 35 9.34 | 7.037 | 16 58 33.0 | + 0.14 |
| 28 | 7 35 29.73 | 7.065 | 16 58 33.2 | + 0.04 | 28 21 5.5 | 7 38 0.49 | 7.224 | 16 58 26.7 | – 0.67 |
| 29 | 7 38 21.55 | 7.251 | 16 58 24.6 | – 0.77 | 29 21 4.5 | 7 40 56.04 | 7.404 | 16 58 0.7 | 1.50 |
| 30 | 7 41 17.74 | 7.430 | 16 57 56.1 | 1.61 | 30 21 3.6 | 7 43 55.83 | 7.577 | 16 57 14.3 | 2.37 |
| 31 | 7 44 18.15 | +7.602 | +16 57 7.1 | – 2.48 | 31 21 2.7 | 7 46 59.68 | +7.743 | +16 56 6.6 | – 3.27 |

# VENUS, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Sept. 1 | 7 47 22.60 | +7.767 | +16 55 56.7 | − 3.39 | 1 21 1.9 | 7 50 7.44 | +7.903 | +16 54 37.1 | − 4.20 |
| 2 | 7 50 30.93 | 7.926 | 16 54 24.4 | 4.32 | 2 21 1.1 | 7 53 18.94 | 8.056 | 16 52 44.8 | 5.15 |
| 3 | 7 53 42.99 | 8.078 | 16 52 29.2 | 5.28 | 3 21 0.4 | 7 56 34.05 | 8.203 | 16 50 29.4 | 6.14 |
| 4 | 7 56 58.64 | 8.224 | 16 50 10.7 | 6.27 | 4 20 59.7 | 7 59 52.63 | 8.344 | 16 47 49.6 | 7.16 |
| 5 | 8 0 17.72 | 8.364 | 16 47 27.9 | 7.29 | 5 20 59.1 | 8 3 14.51 | 8.479 | 16 44 45.3 | 8.19 |
| 6 | 8 3 40.09 | 8.498 | 16 44 20.4 | 8.33 | 6 20 58.6 | 8 6 39.55 | 8.608 | 16 41 15.9 | 9.24 |
| 7 | 8 7 5.60 | 8.626 | 16 40 47.8 | 9.38 | 7 20 58.2 | 8 10 7.63 | 8.732 | 16 37 21.2 | 10.32 |
| 8 | 8 10 34.12 | 8.749 | 16 36 49.7 | 10.46 | 8 20 57.8 | 8 13 38.60 | 8.850 | 16 33 0.3 | 11.42 |
| 9 | 8 14 5.51 | 8.866 | 16 32 25.4 | 11.56 | 9 20 57.4 | 8 17 12.34 | 8.962 | 16 28 13.1 | 12.53 |
| 10 | 8 17 39.64 | 8.977 | 16 27 34.6 | 12.68 | 10 20 57.1 | 8 20 48.70 | 9.068 | 16 22 58.8 | 13.66 |
| 11 | 8 21 16.37 | 9.083 | 16 22 16.9 | 13.81 | 11 20 56.8 | 8 24 27.59 | 9.170 | 16 17 17.4 | 14.79 |
| 12 | 8 24 55.61 | 9.184 | 16 16 32.0 | 14.94 | 12 20 56.6 | 8 28 8.83 | 9.266 | 16 11 8.7 | 15.93 |
| 13 | 8 28 37.18 | 9.279 | 16 10 19.7 | 16.08 | 13 20 56.3 | 8 31 52.33 | 9.358 | 16 4 32.5 | 17.08 |
| 14 | 8 32 21.00 | 9.370 | 16 3 39.9 | 17.23 | 14 20 56.1 | 8 35 37.96 | 9.445 | 15 57 28.6 | 18.24 |
| 15 | 8 36 6.92 | 9.456 | 15 56 32.4 | 18.39 | 15 20 55.9 | 8 39 25.63 | 9.528 | 15 49 56.7 | 19.41 |
| 16 | 8 39 54.86 | 9.538 | 15 48 56.9 | 19.56 | 16 20 55.8 | 8 43 15.22 | 9.604 | 15 41 56.8 | 20.58 |
| 17 | 8 43 44.70 | 9.614 | 15 40 53.4 | 20.73 | 17 20 55.8 | 8 47 6.63 | 9.678 | 15 33 28.7 | 21.76 |
| 18 | 8 47 36.35 | 9.687 | 15 32 21.7 | 21.91 | 18 20 55.7 | 8 50 59.75 | 9.747 | 15 24 32.5 | 22.93 |
| 19 | 8 51 29.69 | 9.756 | 15 23 21.9 | 23.08 | 19 20 55.7 | 8 54 54.49 | 9.814 | 15 15 8.1 | 24.10 |
| 20 | 8 55 24.64 | 9.822 | 15 13 53.9 | 24.25 | 20 20 55.7 | 8 58 50.77 | 9.875 | 15 5 15.5 | 25.27 |
| 21 | 8 59 21.11 | 9.883 | 15 3 57.7 | 25.42 | 21 20 55.7 | 9 2 48.50 | 9.934 | 14 54 54.7 | 26.45 |
| 22 | 9 3 19.02 | 9.941 | 14 53 33.3 | 26.60 | 22 20 55.8 | 9 6 47.60 | 9.990 | 14 44 5.8 | 27.62 |
| 23 | 9 7 18.28 | 9.996 | 14 42 40.8 | 27.77 | 23 20 55.8 | 9 10 47.99 | 10.042 | 14 32 48.9 | 28.79 |
| 24 | 9 11 18.82 | 10.048 | 14 31 20.3 | 28.94 | 24 20 55.9 | 9 14 49.60 | 10.092 | 14 21 3.9 | 29.95 |
| 25 | 9 15 20.57 | 10.097 | 14 19 31.8 | 30.10 | 25 20 56.0 | 9 18 52.37 | 10.138 | 14 8 51.0 | 31.11 |
| 26 | 9 19 23.46 | 10.143 | 14 7 15.4 | 31.26 | 26 20 56.1 | 9 22 56.21 | 10.183 | 13 56 10.4 | 32.26 |
| 27 | 9 23 27.42 | 10.187 | 13 54 31.3 | 32.41 | 27 20 56.2 | 9 27 1.09 | 10.224 | 13 43 2.2 | 33.42 |
| 28 | 9 27 32.40 | 10.228 | 13 41 19.6 | 33.56 | 28 20 56.4 | 9 31 6.93 | 10.263 | 13 29 26.4 | 34.56 |
| 29 | 9 31 38.34 | 10.266 | 13 27 40.4 | 34.70 | 29 20 56.6 | 9 35 13.70 | 10.300 | 13 15 23.3 | 35.69 |
| 30 | 9 35 45.19 | 10.303 | 13 13 34.0 | 35.83 | 30 20 56.8 | 9 39 21.32 | 10.334 | 13 0 53.2 | 36.81 |
| Oct. 1 | 9 39 52.88 | 10.337 | 12 59 0.6 | 36.95 | 1 20 57.0 | 9 43 29.76 | 10.368 | 12 45 56.3 | 37.92 |
| 2 | 9 44 1.38 | 10.370 | 12 44 0.4 | 38.06 | 2 20 57.2 | 9 47 38.96 | 10.398 | 12 30 32.8 | 39.03 |
| 3 | 9 48 10.64 | 10.400 | 12 28 33.6 | 39.16 | 3 20 57.4 | 9 51 48.88 | 10.427 | 12 14 42.9 | 40.12 |
| 4 | 9 52 20.61 | 10.429 | 12 12 40.5 | 40.25 | 4 20 57.6 | 9 55 59.46 | 10.455 | 11 58 26.9 | 41.20 |
| 5 | 9 56 31.24 | 10.456 | 11 56 21.5 | 41.33 | 5 20 57.8 | 10 0 10.69 | 10.481 | 11 41 45.3 | 42.27 |
| 6 | 10 0 42.50 | 10.482 | 11 39 36.9 | 42.39 | 6 20 58.1 | 10 4 22.51 | 10.504 | 11 24 38.4 | 43.31 |
| 7 | 10 4 54.35 | 10.505 | 11 22 27.0 | 43.43 | 7 20 58.3 | 10 8 34.88 | 10.526 | 11 7 6.5 | 44.34 |
| 8 | 10 9 6.74 | 10.527 | 11 4 52.2 | 44.46 | 8 20 58.6 | 10 12 47.76 | 10.548 | 10 49 10.1 | 45.35 |
| 9 | 10 13 19.64 | 10.548 | 10 46 52.9 | 45.47 | 9 20 58.9 | 10 17 1.13 | 10.567 | 10 30 49.7 | 46.35 |
| 10 | 10 17 33.02 | 10.567 | 10 28 29.7 | 46.46 | 10 20 59.2 | 10 21 14.96 | 10.584 | 10 12 5.7 | 47.32 |
| 11 | 10 21 46.85 | 10.584 | 10 9 43.0 | 47.43 | 11 20 59.5 | 10 25 29.20 | 10.601 | 9 52 58.5 | 48.27 |
| 12 | 10 26 1.08 | 10.601 | 9 50 33.2 | 48.38 | 12 20 59.8 | 10 29 43.81 | 10.616 | 9 33 28.7 | 49.21 |
| 13 | 10 30 15.68 | 10.616 | 9 31 0.8 | 49.31 | 13 21 0.1 | 10 33 58.80 | 10.632 | 9 13 36.7 | 50.12 |
| 14 | 10 34 30.66 | 10.631 | 9 11 6.4 | 50.22 | 14 21 0.4 | 10 38 14.13 | 10.645 | 8 53 23.2 | 51.00 |
| 15 | 10 38 45.97 | 10.644 | 8 50 50.5 | 51.10 | 15 21 0.7 | 10 42 29.77 | 10.657 | 8 32 48.6 | 51.87 |
| 16 | 10 43 1.59 | 10.656 | 8 30 13.6 | 51.96 | 16 21 1.1 | 10 46 45.71 | 10.669 | 8 11 53.6 | 52.71 |
| 17 | 10 47 17.51 | 10.668 | 8 9 16.4 | 52.80 | 17 21 1.4 | 10 51 1.92 | 10.681 | 7 50 38.5 | 53.53 |
| 18 | 10 51 33.70 | 10.680 | 7 47 59.2 | 53.62 | 18 21 1.8 | 10 55 18.41 | 10.692 | 7 29 4.3 | 54.33 |
| 19 | 10 55 50.16 | 10.691 | 7 26 22.9 | 54.41 | 19 21 2.1 | 10 59 35.15 | 10.703 | 7 7 11.2 | 55.09 |
| 20 | 11 0 6.87 | 10.702 | 7 4 27.8 | 55.17 | 20 21 2.4 | 11 3 52.14 | 10.713 | 6 45 0.2 | 55.83 |
| 21 | 11 4 23.83 | 10.712 | 6 42 14.9 | 55.91 | 21 21 2.7 | 11 8 9.37 | 10.723 | 6 22 31.4 | 56.56 |
| 22 | 11 8 41.03 | 10.722 | 6 19 44.3 | 56.63 | 22 21 3.1 | 11 12 26.83 | 10.733 | 5 59 45.6 | 57.25 |
| 23 | 11 12 58.46 | 10.732 | 5 56 56.8 | 57.32 | 23 21 3.4 | 11 16 44.54 | 10.742 | 5 36 43.4 | 57.92 |
| 24 | 11 17 16.14 | 10.741 | 5 33 53.0 | 57.99 | 24 21 3.8 | 11 21 2.50 | 10.752 | 5 13 25.4 | 58.57 |
| 25 | 11 21 34.06 | 10.751 | 5 10 33.4 | 58.63 | 25 21 4.2 | 11 25 20.70 | 10.763 | 4 49 52.2 | 59.19 |
| 26 | 11 25 52.23 | 10.762 | 4 46 58.7 | 59.25 | 26 21 4.6 | 11 29 39.16 | 10.774 | 4 26 4.2 | 59.80 |
| 27 | 11 30 10.66 | 10.773 | 4 23 9.3 | 59.85 | 27 21 4.9 | 11 33 57.86 | 10.785 | 4 2 2.1 | 60.37 |
| 28 | 11 34 29.33 | 10.784 | 3 59 5.9 | 60.42 | 28 21 5.3 | 11 38 16.84 | 10.797 | 3 37 46.7 | 60.91 |
| 29 | 11 38 48.28 | 10.796 | 3 34 49.3 | 60.96 | 29 21 5.6 | 11 42 36.11 | 10.809 | 3 13 18.5 | 61.44 |
| 30 | 11 43 7.52 | 10.808 | 3 10 20.0 | 61.48 | 30 21 6.0 | 11 46 55.68 | 10 822 | 2 48 38.1 | 61.93 |
| 31 | 11 47 27.05 | 10.821 | 2 45 38.6 | 61.97 | 31 21 6.4 | 11 51 15.55 | 10.835 | 2 23 46.2 | 62.39 |
| 32 | 11 51 46.89 | 10.834 | + 2 20 45.7 | −62.43 | 32 21 6.8 | 11 55 35.74 | 10.849 | + 1 58 43.5 | −62.83 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Nov. 1 | 11 51 46.89 | 10.834 | + 2 20 45.7 | -62.43 | 1 21 6.8 | 11 55 35.74 | 10.849 | + 1 58 43.5 | -62.83 |
| 2 | 11 56 7.05 | 10.848 | 1 55 42.1 | 62.86 | 2 21 7.2 | 11 59 56.27 | 10.863 | 1 33 30.5 | 63.24 |
| 3 | 12 0 27.55 | 10.862 | 1 30 22.4 | 63.27 | 3 21 7.6 | 12 4 17.16 | 10.878 | 1 8 7.9 | 63.63 |
| 4 | 12 4 48.41 | 10.877 | 1 5 25.4 | 63.65 | 4 21 8.0 | 12 8 38.41 | 10.893 | 0 42 36.6 | 63.98 |
| 5 | 12 9 9.63 | 10.892 | 0 39 33.3 | 64.00 | 5 21 8.4 | 12 13 0.06 | 10.910 | + 0 16 57.0 | 64.32 |
| 6 | 12 13 31.25 | 10.909 | + 0 13 53.2 | 64.33 | 6 21 8.8 | 12 17 22.12 | 10.927 | - 0 8 50.2 | 64.61 |
| 7 | 12 17 53.28 | 10.926 | - 0 11 54.3 | 64.62 | 7 21 9.3 | 12 21 44.60 | 10.945 | 0 34 44.0 | 64.87 |
| 8 | 12 22 15.73 | 10.944 | 0 37 48.4 | 64.88 | 8 21 9.7 | 12 26 7.52 | 10.964 | 1 0 43.7 | 65.11 |
| 9 | 12 26 38.62 | 10.963 | 1 3 48.3 | 65.11 | 9 21 10.2 | 12 30 30.88 | 10.984 | 1 26 48.6 | 65.31 |
| 10 | 12 31 1.96 | 10.983 | 1 29 53.3 | 65.31 | 10 21 10.6 | 12 34 54 74 | 11.004 | 1 52 58.1 | 65.48 |
| 11 | 12 35 25.79 | 11.003 | 1 56 2.8 | 65.48 | 11 21 11.1 | 12 39 19.08 | 11.025 | 2 19 11.4 | 65.62 |
| 12 | 12 39 50.11 | 11.024 | 2 22 16.0 | 65.61 | 12 21 11.5 | 12 43 43.94 | 11.047 | 2 45 27.6 | 65.73 |
| 13 | 12 44 14.94 | 11.046 | 2 48 32.0 | 65.72 | 13 21 12.0 | 12 48 9.32 | 11.070 | 3 11 46.1 | 65.81 |
| 14 | 12 48 40.30 | 11.069 | 3 14 50.2 | 65.79 | 14 21 12.5 | 12 52 35.26 | 11.093 | 3 38 6.1 | 65.86 |
| 15 | 12 53 6.22 | 11.092 | 3 41 9.8 | 65.84 | 15 21 13.0 | 12 57 1.78 | 11.118 | 4 4 26.9 | 65.87 |
| 16 | 12 57 32.72 | 11.117 | 4 7 30.1 | 65.85 | 16 21 13.5 | 13 1 28.91 | 11.143 | 4 30 47.7 | 65.86 |
| 17 | 13 1 59.82 | 11.142 | 4 33 50.3 | 65.83 | 17 21 14.0 | 13 5 56.65 | 11.170 | 4 57 7.6 | 65.81 |
| 18 | 13 6 27.54 | 11.169 | 5 0 9.5 | 65.78 | 18 21 14.5 | 13 10 25.05 | 11.197 | 5 23 25.9 | 65.73 |
| 19 | 13 10 55.91 | 11.196 | 5 26 27.0 | 65.69 | 19 21 15.1 | 13 14 54.10 | 11.226 | 5 49 42.0 | 65.61 |
| 20 | 13 15 24.94 | 11.225 | 5 52 42.2 | 65.57 | 20 21 15.6 | 13 19 23.85 | 11.255 | 6 15 55.0 | 65.47 |
| 21 | 13 19 54.67 | 11.254 | 6 18 54.2 | 65.42 | 21 21 16.2 | 13 23 54.31 | 11.286 | 6 42 4.2 | 65.29 |
| 22 | 13 24 25.11 | 11.285 | 6 45 2.3 | 65.24 | 22 21 16.8 | 13 28 25.52 | 11.317 | 7 8 8.7 | 65.08 |
| 23 | 13 28 56.30 | 11.316 | 7 11 5.6 | 65.03 | 23 21 17.4 | 13 32 57.51 | 11.350 | 7 34 7.8 | 64.85 |
| 24 | 13 33 28.26 | 11.349 | 7 37 3.4 | 64.79 | 24 21 18.0 | 13 37 30.30 | 11.383 | 8 0 0.7 | 64.57 |
| 25 | 13 38 1.03 | 11.382 | 8 2 54.9 | 64.51 | 25 21 18.6 | 13 42 3.92 | 11.418 | 8 25 46.8 | 64.27 |
| 26 | 13 42 34.62 | 11.417 | 8 28 39.5 | 64.20 | 26 21 19.2 | 13 46 38.38 | 11.454 | 8 51 25.2 | 63.93 |
| 27 | 13 47 9.06 | 11.453 | 8 54 16.3 | 63.86 | 27 21 19.9 | 13 51 13.73 | 11.492 | 9 16 55.4 | 63.56 |
| 28 | 13 51 44.39 | 11.491 | 9 19 44.8 | 63.49 | 28 21 20.5 | 13 55 49.98 | 11.531 | 9 42 16.4 | 63.17 |
| 29 | 13 56 20.62 | 11.530 | 9 45 4.0 | 63.09 | 29 21 21.2 | 14 0 27.18 | 11.571 | 10 7 27.4 | 62.74 |
| 30 | 14 0 57.79 | 11.570 | 10 10 13.2 | 62.66 | 30 21 21.9 | 14 5 5.35 | 11.611 | 10 32 27.7 | 62.27 |
| Dec. 1 | 14 5 35.93 | 11.610 | 10 35 11.5 | 62.19 | 1 21 22.6 | 14 9 44.50 | 11.653 | 10 57 16.4 | 61.77 |
| 2 | 14 10 15.05 | 11.652 | 10 59 58.2 | 61.69 | 2 21 23.3 | 14 14 24.68 | 11.696 | 11 21 52.8 | 61.25 |
| 3 | 14 14 55.20 | 11.695 | 11 24 32.5 | 61.16 | 3 21 24.1 | 14 19 5.85 | 11.739 | 11 46 16.2 | 60.70 |
| 4 | 14 19 36.34 | 11.738 | 11 48 53.7 | 60.60 | 4 21 24.8 | 14 23 48.12 | 11.784 | 12 10 25.7 | 60.10 |
| 5 | 14 24 18.58 | 11.782 | 12 13 0.9 | 60.00 | 5 21 25.6 | 14 28 31.46 | 11.829 | 12 34 20.5 | 59.46 |
| 6 | 14 29 1.88 | 11.827 | 12 36 53.3 | 59.36 | 6 21 26.4 | 14 33 15.90 | 11.875 | 12 57 59.7 | 58.80 |
| 7 | 14 33 46.28 | 11.873 | 13 0 30.0 | 58.69 | 7 21 27.2 | 14 38 1.42 | 11.921 | 13 21 22.5 | 58.10 |
| 8 | 14 38 31.76 | 11.919 | 13 23 50.2 | 57.99 | 8 21 28.0 | 14 42 48.09 | 11.968 | 13 44 28.2 | 57.37 |
| 9 | 14 43 18.39 | 11.966 | 13 46 53.2 | 57.25 | 9 21 28.9 | 14 47 35.91 | 12.016 | 14 7 15.9 | 56.60 |
| 10 | 14 48 6.16 | 12.014 | 14 9 38.1 | 56.48 | 10 21 29.8 | 14 52 24.88 | 12.065 | 14 29 44.7 | 55.80 |
| 11 | 14 52 55.08 | 12.063 | 14 32 4.1 | 55.68 | 11 21 30.7 | 14 57 15.01 | 12.114 | 14 51 53.8 | 54.96 |
| 12 | 14 57 45.15 | 12.111 | 14 54 10.4 | 54.84 | 12 21 31.6 | 15 2 6.32 | 12.163 | 15 13 42.5 | 54.09 |
| 13 | 15 2 36.39 | 12.160 | 15 15 56.1 | 53.96 | 13 21 32.6 | 15 6 58.81 | 12.212 | 15 35 10.0 | 53.19 |
| 14 | 15 7 28.81 | 12.209 | 15 37 20.5 | 53.06 | 14 21 33.6 | 15 11 51.49 | 12.261 | 15 56 15.3 | 52.25 |
| 15 | 15 12 22.41 | 12.258 | 15 58 22.7 | 52.12 | 15 21 34.5 | 15 16 47.34 | 12.310 | 16 16 57.7 | 51.29 |
| 16 | 15 17 17.18 | 12.307 | 16 19 1.9 | 51.15 | 16 21 35.5 | 15 21 43.38 | 12.360 | 16 37 16.4 | 50.28 |
| 17 | 15 22 13.14 | 12.356 | 16 39 17.3 | 50.14 | 17 21 36.5 | 15 26 40.61 | 12.409 | 16 57 10.6 | 49.24 |
| 18 | 15 27 10.28 | 12.405 | 16 59 8.2 | 49.10 | 18 21 37.5 | 15 31 39.04 | 12.459 | 17 16 39.6 | 48.18 |
| 19 | 15 32 8.61 | 12.455 | 17 18 33.8 | 48.03 | 19 21 38.6 | 15 36 38.66 | 12.509 | 17 35 42.7 | 47.08 |
| 20 | 15 37 8.13 | 12.504 | 17 37 33.4 | 46.93 | 20 21 39.6 | 15 41 39.46 | 12.558 | 17 54 19.1 | 45.95 |
| 21 | 15 42 8.82 | 12.553 | 17 56 6.3 | 45.80 | 21 21 40.7 | 15 46 41.44 | 12.607 | 18 12 28.0 | 44.79 |
| 22 | 15 47 10.68 | 12.602 | 18 14 11.6 | 44.64 | 22 21 41.8 | 15 51 44.58 | 12.655 | 18 30 8.4 | 43.59 |
| 23 | 15 52 13.70 | 12.650 | 18 31 48.5 | 43.44 | 23 21 42.9 | 15 56 48.88 | 12.703 | 18 47 19.9 | 42.37 |
| 24 | 15 57 17.88 | 12.698 | 18 48 56.4 | 42.22 | 24 21 44.0 | 16 1 54.33 | 12.751 | 19 4 1.8 | 41.11 |
| 25 | 16 2 23.20 | 12.745 | 19 5 34.7 | 40.96 | 25 21 45.2 | 16 7 0.93 | 12.798 | 19 20 13.3 | 39.83 |
| 26 | 16 7 29.66 | 12.792 | 19 21 42.5 | 39.68 | 26 21 46.4 | 16 12 8.66 | 12.845 | 19 35 53.7 | 38.52 |
| 27 | 16 12 37.24 | 12.838 | 19 37 19.2 | 38.37 | 27 21 47.7 | 16 17 17.51 | 12.891 | 19 51 2.4 | 37.19 |
| 28 | 16 17 45.93 | 12.884 | 19 52 24.2 | 37.03 | 28 21 48.9 | 16 22 27.46 | 12.937 | 20 5 38.6 | 35.83 |
| 29 | 16 22 55.71 | 12.930 | 20 6 56.7 | 35.67 | 29 21 50.1 | 16 27 38.47 | 12.981 | 20 19 41.9 | 34.44 |
| 30 | 16 28 6.55 | 12.974 | 20 20 56.2 | 34.28 | 30 21 51.3 | 16 32 50.54 | 13.024 | 20 33 11.4 | 33.02 |
| 31 | 16 33 18.44 | 13.017 | 20 34 22.0 | 32.86 | 31 21 52.6 | 16 38 3.63 | 13.066 | 20 46 6 6 | 31.57 |
| 32 | 16 38 31.35 | 13.059 | -20 47 13.4 | -31.42 | 32 21 53.8 | 16 43 17.74 | 13.107 | -20 58 26.8 | -30.10 |

# MARS, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Jan. 1 | 23 21 3.96 | +6.586 | - 4 51 47.5 | +45.30 | 1 4 38.0 | 23 21 34.48 | +6.580 | - 4 48 17.3 | +45.27 |
| 2 | 23 23 42.00 | 6.581 | 4 33 39.3 | 45.36 | 2 4 36.7 | 23 24 12.35 | 6.575 | 4 30 9.9 | 45.33 |
| 3 | 23 26 19.91 | 6.577 | 4 15 29.8 | 45.41 | 3 4 35.4 | 23 26 50.09 | 6.570 | 4 12 1.4 | 45.38 |
| 4 | 23 28 57.70 | 6.572 | 3 57 19.4 | 45.45 | 4 4 34.1 | 23 29 27.72 | 6.565 | 3 53 51.8 | 45.42 |
| 5 | 23 31 35.38 | 6 567 | 3 39 8.0 | 45.49 | 5 4 32.8 | 23 32 5.23 | 6.560 | 3 35 41.2 | 45.46 |
| 6 | 23 34 12.94 | 6.562 | 3 20 55.9 | 45.52 | 6 4 31.5 | 23 34 42.62 | 6.555 | 3 17 30.0 | 45.48 |
| 7 | 23 36 50.39 | 6.558 | 3 2 43.2 | 45.54 | 7 4 30.1 | 23 37 19.90 | 6.551 | 2 59 18.2 | 45.50 |
| 8 | 23 39 27.72 | 6.553 | 2 44 30.1 | 45.55 | 8 4 28.8 | 23 39 57.07 | 6.547 | 2 41 6.0 | 45.51 |
| 9 | 23 42 4.94 | 6.549 | 2 26 16.7 | 45.56 | 9 4 27.5 | 23 42 34.13 | 6.543 | 2 22 53.6 | 45.52 |
| 10 | 23 44 42.07 | 6.545 | 2 8 3.3 | 45.56 | 10 4 26.2 | 23 45 11.10 | 6.539 | 2 4 41.2 | 45.52 |
| 11 | 23 47 19.12 | 6.542 | 1 49 49.8 | 45.56 | 11 4 24.8 | 23 47 47.99 | 6.535 | 1 46 28.8 | 45.51 |
| 12 | 23 49 56.08 | 6.539 | 1 31 36.6 | 45.54 | 12 4 23.5 | 23 50 24.79 | 6.531 | 1 28 16.7 | 45.50 |
| 13 | 23 52 32.97 | 6.536 | 1 13 23.6 | 45.53 | 13 4 22.2 | 23 53 1.52 | 6.529 | 1 10 4.8 | 45.49 |
| 14 | 23 55 9.79 | 6.533 | 0 55 11.0 | 45.51 | 14 4 20.9 | 23 55 38.20 | 6.527 | 0 51 53.3 | 45.47 |
| 15 | 23 57 46.57 | 6.531 | 0 36 59.1 | 45.48 | 15 4 19.5 | 23 58 14.82 | 6.525 | 0 33 42.5 | 45.44 |
| 16 | 0 0 23.28 | 6.529 | 0 18 47.8 | 45.45 | 16 4 18.2 | 0 0 51.38 | 6.522 | - 0 15 32.5 | 45.41 |
| 17 | 0 2 59.95 | 6.527 | - 0 0 37.5 | 45.41 | 17 4 16.9 | 0 3 27.89 | 6.520 | + 0 2 36.7 | 45.37 |
| 18 | 0 5 36.57 | 6.525 | + 0 17 31.9 | 45.36 | 18 4 15.5 | 0 6 4.36 | 6.519 | 0 20 44.9 | 45 32 |
| 19 | 0 8 13.18 | 6.525 | 0 35 40.1 | 45.31 | 19 4 14.2 | 0 8 40.81 | 6.519 | 0 38 51.9 | 45.26 |
| 20 | 0 10 49.76 | 6.524 | 0 53 46.9 | 45.25 | 20 4 12.9 | 0 11 17.24 | 6.518 | 0 56 57.5 | 45.20 |
| 21 | 0 13 26.34 | 6.524 | 1 11 52.2 | 45.19 | 21 4 11.5 | 0 13 53.67 | 6.518 | 1 15 1.6 | 45.14 |
| 22 | 0 16 2.90 | 6.524 | 1 29 56.1 | 45.13 | 22 4 10.2 | 0 16 30.10 | 6.518 | 1 33 4.2 | 45.08 |
| 23 | 0 18 39.48 | 6.524 | 1 47 58.6 | 45.07 | 23 4 8.9 | 0 19 6.53 | 6.518 | 1 51 5.4 | 45.02 |
| 24 | 0 21 16.06 | 6.525 | 2 5 59.5 | 44.99 | 24 4 7.5 | 0 21 42.97 | 6.519 | 2 9 5.0 | 44.94 |
| 25 | 0 23 52.68 | 6.525 | 2 23 58.3 | 44.90 | 25 4 6.2 | 0 24 19.42 | 6.519 | 2 27 2.5 | 44.85 |
| 26 | 0 26 29.26 | 6.526 | 2 41 54.8 | 44.81 | 26 4 4.8 | 0 26 55.89 | 6.520 | 2 44 57.7 | 44.75 |
| 27 | 0 29 5.90 | 6.527 | 2 59 49.2 | 44.71 | 27 4 3.5 | 0 29 32.39 | 6.522 | 3 2 50.6 | 44.65 |
| 28 | 0 31 42.57 | 6.528 | 3 17 41.2 | 44.62 | 28 4 2.2 | 0 32 8.92 | 6.523 | 3 20 41.2 | 44.55 |
| 29 | 0 34 19.27 | 6.530 | 3 35 30.6 | 44.51 | 29 4 0.9 | 0 34 45.48 | 6.524 | 3 38 29.3 | 44.44 |
| 30 | 0 36 56.00 | 6.532 | 3 53 17.5 | 44.39 | 30 3 59.6 | 0 37 22.07 | 6.526 | 3 56 14.7 | 44.33 |
| 31 | 0 39 32.78 | 6.533 | 4 11 1.5 | 44.27 | 31 3 58.2 | 0 39 58.71 | 6.528 | 4 13 57.2 | 44.21 |
| Feb. 1 | 0 42 9.60 | 6.535 | 4 28 42.5 | 44.14 | 1 3 56.9 | 0 42 35.40 | 6.529 | 4 31 36.7 | 44.08 |
| 2 | 0 44 46.46 | 6.537 | 4 46 20.2 | 44.00 | 2 3 55.6 | 0 45 12.12 | 6 531 | 4 49 12.9 | 43.94 |
| 3 | 0 47 23.37 | 6.539 | 5 3 54.6 | 43.86 | 3 3 54.2 | 0 47 48.89 | 6.534 | 5 6 45.7 | 43.79 |
| 4 | 0 50 0.34 | 6.542 | 5 21 25.4 | 43.71 | 4 3 52.9 | 0 50 25.73 | 6.537 | 5 24 15.0 | 43.64 |
| 5 | 0 52 37.38 | 6.544 | 5 38 52.6 | 43.56 | 5 3 51.6 | 0 53 2.63 | 6.539 | 5 41 40.7 | 43.49 |
| 6 | 0 55 14.48 | 6.547 | 5 56 16.1 | 43.40 | 6 3 50.3 | 0 55 39.59 | 6.542 | 5 59 2.6 | 43.33 |
| 7 | 0 57 51.64 | 6.550 | 6 13 35.7 | 43.23 | 7 3 49.0 | 0 58 16.63 | 6.545 | 6 16 20.6 | 43.16 |
| 8 | 1 0 28.89 | 6.554 | 6 30 51.3 | 43.06 | 8 3 47.6 | 1 0 53.75 | 6.549 | 6 33 34.6 | 43.00 |
| 9 | 1 3 6.22 | 6.557 | 6 48 2.8 | 42.89 | 9 3 46.3 | 1 3 30.95 | 6.552 | 6 50 44.5 | 42.82 |
| 10 | 1 5 43.65 | 6.561 | 7 5 9.9 | 42.71 | 10 3 45.0 | 1 6 8.24 | 6.555 | 7 7 50.0 | 42.64 |
| 11 | 1 8 21.16 | 6.565 | 7 22 12.7 | 42.52 | 11 3 43.7 | 1 8 45.63 | 6.559 | 7 24 51.1 | 42.45 |
| 12 | 1 10 58.78 | 6.569 | 7 39 10.8 | 42.33 | 12 3 42.4 | 1 11 23.12 | 6.564 | 7 41 47.7 | 42.26 |
| 13 | 1 13 36.49 | 6.574 | 7 56 4.4 | 42.13 | 13 3 41.1 | 1 14 0.71 | 6.568 | 7 58 39.7 | 42.06 |
| 14 | 1 16 14.32 | 6.579 | 8 12 53.2 | 41.93 | 14 3 39.8 | 1 16 38.41 | 6.573 | 8 15 26.9 | 41.86 |
| 15 | 1 18 52.28 | 6.584 | 8 29 37.1 | 41.73 | 15 3 38.5 | 1 19 16.24 | 6.579 | 8 32 9.1 | 41.66 |
| 16 | 1 21 30.38 | 6.590 | 8 46 16.0 | 41.52 | 16 3 37.2 | 1 21 54.21 | 6.585 | 8 48 46.3 | 41.45 |
| 17 | 1 24 8.61 | 6.596 | 9 2 49.9 | 41.30 | 17 3 35.9 | 1 24 32.33 | 6.591 | 9 5 18.6 | 41.24 |
| 18 | 1 26 46.99 | 6.602 | 9 19 18.7 | 41.08 | 18 3 34.5 | 1 27 10.59 | 6.597 | 9 21 45.7 | 41.02 |
| 19 | 1 29 25.52 | 6.600 | 9 35 42.1 | 40.86 | 19 3 33.2 | 1 20 49.00 | 6.604 | 9 38 7.4 | 40.79 |
| 20 | 1 32 4.21 | 6.615 | 9 51 59.9 | 40.63 | 20 3 31.9 | 1 32 27.57 | 6.610 | 9 54 23.6 | 40.57 |
| 21 | 1 34 43.05 | 6.622 | 10 8 12.3 | 40.39 | 21 3 30.6 | 1 35 6.30 | 6.617 | 10 10 34.2 | 40.33 |
| 22 | 1 37 22.07 | 6.629 | 10 24 19.0 | 40.15 | 22 3 29.4 | 1 37 45.19 | 6.624 | 10 26 39.2 | 40.08 |
| 23 | 1 40 1.25 | 6.636 | 10 40 19.8 | 39.91 | 23 3 28.1 | 1 40 24.25 | 6.631 | 10 42 38.3 | 39.84 |
| 24 | 1 42 40.61 | 6.644 | 10 56 14.6 | 39.66 | 24 3 26.8 | 1 43 3.49 | 6.639 | 10 58 31.4 | 39.58 |
| 25 | 1 45 20.15 | 6.651 | 11 12 3.4 | 39.41 | 25 3 25.5 | 1 45 42.92 | 6.647 | 11 14 18.4 | 39.32 |
| 26 | 1 47 59.87 | 6.659 | 11 27 46.0 | 39.14 | 26 3 24.2 | 1 48 22.53 | 6.654 | 11 29 59.2 | 39.07 |
| 27 | 1 50 39.77 | 6.666 | 11 43 22.2 | 38.87 | 27 3 23.0 | 1 51 2.32 | 6.662 | 11 45 33.7 | 38.80 |
| 28 | 1 53 19.86 | 6.674 | 11 58 52.0 | 38.60 | 28 3 21.7 | 1 53 42.29 | 6.669 | 12 1 1.7 | 38.53 |
| 29 | 1 56 0.13 | 6.682 | 12 14 15.2 | 38.32 | 29 3 20.4 | 1 56 22.44 | 6.677 | 12 16 23.1 | 38.25 |
| 30 | 1 58 40.59 | +6.690 | +12 29 31.5 | +38.04 | 30 3 19.2 | 1 59 2.79 | +6.686 | +12 31 37.7 | +37.97 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Mar. 1 | 1 58 40.59 | +6.690 | +12 29 31.5 | +38.04 | 1 3 19.2 | 1 59 2.79 | +6.686 | +12 31 37.7 | +37.97 |
| 2 | 2 1 21.24 | 6.698 | 12 44 41.0 | 37.75 | 2 3 17.9 | 2 1 43.32 | 6.694 | 12 46 45.4 | 37.67 |
| 3 | 2 4 2.09 | 6.706 | 12 59 43.4 | 37.45 | 3 3 16.6 | 2 4 24.06 | 6.702 | 13 1 46.0 | 37.37 |
| 4 | 2 6 43.14 | 6.714 | 13 14 38.7 | 37.15 | 4 3 15.4 | 2 7 4.99 | 6.710 | 13 16 39.5 | 37.07 |
| 5 | 2 9 24.37 | 6.722 | 13 29 26.6 | 36.84 | 5 3 14.1 | 2 9 46.11 | 6.718 | 13 31 25.7 | 36.77 |
| 6 | 2 12 5.81 | 6.731 | 13 44 7.3 | 36.54 | 6 3 12.9 | 2 12 27.43 | 6.727 | 13 46 4.6 | 36.47 |
| 7 | 2 14 47.44 | 6.739 | 13 58 40.5 | 36.22 | 7 3 11.6 | 2 15 8.95 | 6.735 | 14 0 36.1 | 36.15 |
| 8 | 2 17 29.28 | 6.748 | 14 13 6.1 | 35.90 | 8 3 10.4 | 2 17 50.68 | 6.744 | 14 15 0.0 | 35.83 |
| 9 | 2 20 11.32 | 6.756 | 14 27 23.9 | 35.58 | 9 3 9.1 | 2 20 32.61 | 6.752 | 14 29 16.1 | 35.51 |
| 10 | 2 22 53.57 | 6.765 | 14 41 34.0 | 35.25 | 10 3 7.9 | 2 23 14.75 | 6.761 | 14 43 24.4 | 35.18 |
| 11 | 2 25 36.03 | 6.773 | 14 55 36.1 | 34.92 | 11 3 6.6 | 2 25 57.10 | 6 770 | 14 57 24.7 | 34.84 |
| 12 | 2 28 18.70 | 6.782 | 15 9 30.1 | 34.58 | 12 3 5.4 | 2 28 39.66 | 6.779 | 15 11 17.0 | 34.51 |
| 13 | 2 31 1.60 | 6.792 | 15 23 16.1 | 34.24 | 13 3 4.2 | 2 31 22.44 | 6.788 | 15 25 1.2 | 34.17 |
| 14 | 2 33 44.71 | 6.801 | 15 36 53.9 | 33.90 | 14 3 2.9 | 2 34 5.45 | 6.797 | 15 38 37.2 | 33.83 |
| 15 | 2 36 28.06 | 6.811 | 15 50 23.4 | 33.55 | 15 3 1.7 | 2 36 48.69 | 6.807 | 15 52 5.0 | 33.48 |
| 16 | 2 39 11.65 | 6.821 | 16 3 44.5 | 33.20 | 16 3 0.5 | 2 39 32.17 | 6.816 | 16 5 24.4 | 33.13 |
| 17 | 2 41 55.48 | 6.831 | 16 16 57.1 | 32.84 | 17 2 59.3 | 2 42 15.89 | 6.826 | 16 18 35.3 | 32.78 |
| 18 | 2 44 39.54 | 6.841 | 16 30 1.1 | 32.48 | 18 2 58.1 | 2 44 59.84 | 6.836 | 16 31 37.5 | 32.41 |
| 19 | 2 47 23.84 | 6.851 | 16 42 56.4 | 32.12 | 19 2 56.9 | 2 47 44.03 | 6.846 | 16 44 31.0 | 32.04 |
| 20 | 2 50 8.38 | 6.861 | 16 55 42.8 | 31.75 | 20 2 55.7 | 2 50 28.46 | 6.856 | 16 57 15.7 | 31.68 |
| 21 | 2 52 53.16 | 6.871 | 17 8 20.4 | 31.38 | 21 2 54.5 | 2 53 13.14 | 6.867 | 17 9 51.6 | 31.31 |
| 22 | 2 55 38.19 | 6.881 | 17 20 49.1 | 31.00 | 22 2 53.3 | 2 55 58.06 | 6.877 | 17 22 18.6 | 30.93 |
| 23 | 2 58 23.46 | 6.891 | 17 33 8.6 | 30.62 | 23 2 52.1 | 2 58 43.23 | 6.887 | 17 34 36.4 | 30.55 |
| 24 | 3 1 8.97 | 6.901 | 17 45 18.9 | 30.23 | 24 2 51.0 | 3 1 28.63 | 6.897 | 17 46 45.0 | 30.17 |
| 25 | 3 3 54.72 | 6.911 | 17 57 19.9 | 29.85 | 25 2 49.8 | 3 4 14.27 | 6.907 | 17 58 44.3 | 29.77 |
| 26 | 3 6 40.71 | 6.921 | 18 9 11.5 | 29.45 | 26 2 48.6 | 3 7 0.15 | 6.917 | 18 10 34.2 | 29.37 |
| 27 | 3 9 26.95 | 6.931 | 18 20 53.5 | 29.05 | 27 2 47.4 | 3 9 46.28 | 6.927 | 18 22 14.5 | 28.98 |
| 28 | 3 12 13.42 | 6.941 | 18 32 46.1 | 28.65 | 28 2 46.3 | 3 12 32.65 | 6.936 | 18 33 45.3 | 28.58 |
| 29 | 3 15 0.13 | 6.951 | 18 43 48.7 | 28.24 | 29 2 45.1 | 3 15 19.25 | 6.946 | 18 45 6.4 | 28.17 |
| 30 | 3 17 47.07 | 6.960 | 18 55 1.7 | 27.83 | 30 2 44.0 | 3 18 6.08 | 6.956 | 18 56 17.7 | 27.77 |
| 31 | 3 20 34.22 | 6.970 | 19 6 4.6 | 27.42 | 31 2 42.8 | 3 20 53.13 | 6.965 | 19 7 19.0 | 27.35 |
| Apr. 1 | 3 23 21.61 | 6.979 | 19 16 57.6 | 27.00 | 1 2 41.6 | 3 23 40.40 | 6.974 | 19 18 10.3 | 26.92 |
| 2 | 3 26 9.21 | 6.988 | 19 27 40.4 | 26.57 | 2 2 40.5 | 3 26 27.90 | 6.984 | 19 28 51.4 | 26.50 |
| 3 | 3 28 57.03 | 6.997 | 19 38 13.0 | 26.15 | 3 2 39.3 | 3 29 15.62 | 6.992 | 19 39 22.4 | 26.08 |
| 4 | 3 31 45.06 | 7.006 | 19 48 35.4 | 25.72 | 4 2 38.2 | 3 32 3.54 | 7.001 | 19 49 43.2 | 25.65 |
| 5 | 3 34 33.31 | 7.015 | 19 58 47.5 | 25.28 | 5 2 37.1 | 3 34 51.68 | 7.010 | 19 59 53.6 | 25.22 |
| 6 | 3 37 21.77 | 7.023 | 20 8 49.1 | 24.85 | 6 2 36.0 | 3 37 40.03 | 7.019 | 20 9 53.6 | 24.78 |
| 7 | 3 40 10.44 | 7.032 | 20 18 40.1 | 24.41 | 7 2 34.8 | 3 40 28.59 | 7.028 | 20 19 43.0 | 24.34 |
| 8 | 3 42 59.31 | 7.041 | 20 28 20.5 | 23.97 | 8 2 33.7 | 3 43 17.35 | 7.036 | 20 29 21.8 | 23.90 |
| 9 | 3 45 48.39 | 7.049 | 20 37 50.4 | 23.52 | 9 2 32.6 | 3 46 6.32 | 7.045 | 20 38 50.0 | 23.45 |
| 10 | 3 48 37.67 | 7.057 | 20 47 9.4 | 23.07 | 10 2 31.4 | 3 48 55.49 | 7.053 | 20 48 7.5 | 23.00 |
| 11 | 3 51 27.14 | 7.066 | 20 56 17.7 | 22.62 | 11 2 30.3 | 3 51 44.85 | 7.061 | 20 57 14.2 | 22.55 |
| 12 | 3 54 16.82 | 7.074 | 21 5 15 1 | 22.16 | 12 2 29.2 | 3 54 34.42 | 7.069 | 21 6 10.1 | 22.10 |
| 13 | 3 57 6.71 | 7.083 | 21 14 1.6 | 21.71 | 13 2 28.1 | 3 57 24.19 | 7.077 | 21 14 55.1 | 21.65 |
| 14 | 3 59 56.78 | 7.090 | 21 22 37.1 | 21.25 | 14 2 27.0 | 4 0 14.15 | 7.086 | 21 23 29.1 | 21.19 |
| 15 | 4 2 47.05 | 7.098 | 21 31 1.7 | 20.79 | 15 2 25.9 | 4 3 4.31 | 7.094 | 21 31 52.1 | 20.73 |
| 16 | 4 5 37.51 | 7.106 | 21 39 15.1 | 20.32 | 16 2 24.8 | 4 5 54.66 | 7.102 | 21 40 4.1 | 20.27 |
| 17 | 4 8 28.16 | 7.114 | 21 47 17.4 | 19.86 | 17 2 23.7 | 4 8 45.20 | 7.109 | 21 48 4.9 | 19.80 |
| 18 | 4 11 19.00 | 7.122 | 21 55 8.5 | 19.40 | 18 2 22.6 | 4 11 35.92 | 7.117 | 21 55 54.5 | 19.34 |
| 19 | 4 14 10.01 | 7.129 | 22 2 48.3 | 18.93 | 19 2 21.5 | 4 14 26.82 | 7.124 | 22 3 32.9 | 18.86 |
| 20 | 4 17 1.20 | 7.136 | 22 10 16.8 | 18.45 | 20 2 20.4 | 4 17 17.90 | 7.132 | 22 10 59.9 | 18.38 |
| 21 | 4 19 52.56 | 7.143 | 22 17 33.8 | 17.97 | 21 2 19.3 | 4 20 9.15 | 7.139 | 22 18 15.4 | 17.91 |
| 22 | 4 22 44.07 | 7.150 | 22 24 39.3 | 17.49 | 22 2 18.2 | 4 23 0.56 | 7.145 | 22 25 19.5 | 17.43 |
| 23 | 4 25 35.75 | 7.156 | 22 31 33.4 | 17.01 | 23 2 17.2 | 4 25 52.12 | 7.152 | 22 32 12.2 | 16.95 |
| 24 | 4 28 27.58 | 7.162 | 22 38 15.8 | 16.53 | 24 2 16.1 | 4 28 43.83 | 7.158 | 22 38 53.3 | 16.47 |
| 25 | 4 31 19.55 | 7.168 | 22 44 46.7 | 16.04 | 25 2 15.0 | 4 31 35.69 | 7.164 | 22 45 22.7 | 15.98 |
| 26 | 4 34 11.66 | 7.174 | 22 51 5.8 | 15.55 | 26 2 14.0 | 4 34 27.68 | 7.169 | 22 51 40.4 | 15.50 |
| 27 | 4 37 3.90 | 7.179 | 22 57 13.3 | 15.06 | 27 2 12.9 | 4 37 19.80 | 7.174 | 22 57 46.4 | 15.01 |
| 28 | 4 39 56.25 | 7.184 | 23 3 8.9 | 14.57 | 28 2 11.8 | 4 40 12.03 | 7.179 | 23 3 40.7 | 14.52 |
| 29 | 4 42 48.72 | 7.188 | 23 8 52.6 | 14.07 | 29 2 10.7 | 4 43 4.38 | 7.183 | 23 9 23.2 | 14.03 |
| 30 | 4 45 41.29 | 7.192 | 23 14 24.5 | 13.58 | 30 2 9.7 | 4 45 56.83 | 7.187 | 23 14 53.8 | 13.53 |
| 31 | 4 48 33.95 | +7.196 | +23 19 44.6 | +13.09 | 31 2 8.6 | 4 48 49.37 | +7.190 | +23 20 12.5 | +13.04 |

# MARS, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| May 1 | 4 48 33.95 | +7.196 | +23 19 44.6 | +13.09 | 1 2 8.6 | 4 48 49.37 | +7.190 | +23 20 12.5 | +13.04 |
| 2 | 4 51 26.69 | 7.199 | 23 24 52.7 | 12.59 | 2 2 7.6 | 4 51 41.99 | 7.194 | 23 25 19.3 | 12.53 |
| 3 | 4 54 19.51 | 7.202 | 23 29 48.8 | 12.09 | 3 2 6.5 | 4 54 34.69 | 7.197 | 23 30 14.1 | 12.03 |
| 4 | 4 57 12.41 | 7.205 | 23 34 32.9 | 11.59 | 4 2 5.4 | 4 57 27.47 | 7.200 | 23 34 57.0 | 11.54 |
| 5 | 5 0 5.37 | 7.208 | 23 39 5.1 | 11.09 | 5 2 4.4 | 5 0 20.31 | 7.203 | 23 39 28.0 | 11.04 |
| 6 | 5 2 58.39 | 7.210 | 23 43 25.1 | 10.58 | 6 2 3.3 | 5 3 13.21 | 7.205 | 23 43 46.9 | 10.54 |
| 7 | 5 5 51.45 | 7.212 | 23 47 33.1 | 10.08 | 7 2 2.2 | 5 6 6.14 | 7.207 | 23 47 53.7 | 10.03 |
| 8 | 5 8 44.56 | 7.214 | 23 51 29.0 | 9.58 | 8 2 1.2 | 5 8 59.14 | 7.208 | 23 51 48.4 | 9.52 |
| 9 | 5 11 37.71 | 7.215 | 23 55 12.9 | 9.08 | 9 2 0.1 | 5 11 52.15 | 7.210 | 23 55 31.1 | 9.03 |
| 10 | 5 14 30.90 | 7.216 | 23 58 44.7 | 8.57 | 10 1 59.1 | 5 14 45.20 | 7.211 | 23 59 1.7 | 8.52 |
| 11 | 5 17 24.11 | 7.218 | 24 2 4.4 | 8.07 | 11 1 58.0 | 5 17 38.30 | 7.212 | 24 2 20.2 | 8.02 |
| 12 | 5 20 17.35 | 7.219 | 24 5 12.1 | 7.56 | 12 1 57.0 | 5 20 31.42 | 7.213 | 24 5 26.8 | 7.52 |
| 13 | 5 23 10.60 | 7.219 | 24 8 7.6 | 7.06 | 13 1 55.9 | 5 23 24.54 | 7.213 | 24 8 21.2 | 7.01 |
| 14 | 5 26 3.86 | 7.219 | 24 10 51.0 | 6.55 | 14 1 54.9 | 5 26 17.67 | 7.213 | 24 11 3.4 | 6.51 |
| 15 | 5 28 57.11 | 7.219 | 24 13 22.2 | 6.05 | 15 1 53.8 | 5 29 10.80 | 7.213 | 24 13 33.6 | 6.00 |
| 16 | 5 31 50.37 | 7.219 | 4 15 41.3 | 5.54 | 16 1 52.8 | 5 32 3.93 | 7.213 | 24 15 51.6 | 5.50 |
| 17 | 5 34 43.62 | 7.218 | 24 17 48.3 | 5.04 | 17 1 51.7 | 5 34 57.06 | 7.213 | 24 17 57.6 | 5.00 |
| 18 | 5 37 36.85 | 7.217 | 24 19 43.1 | 4.53 | 18 1 50.7 | 5 37 50.16 | 7.212 | 24 19 51.4 | 4.50 |
| 19 | 5 40 30.05 | 7.216 | 24 21 25.8 | 4.03 | 19 1 49.6 | 5 40 43.23 | 7.210 | 24 21 33.1 | 4.00 |
| 20 | 5 43 23.22 | 7.214 | 24 22 56.4 | 3.52 | 20 1 48.5 | 5 43 36.27 | 7.208 | 24 23 2.7 | 3.49 |
| 21 | 5 46 16.33 | 7.212 | 24 24 14.9 | 3.01 | 21 1 47.5 | 5 46 29.25 | 7.207 | 24 24 20.2 | 2.98 |
| 22 | 5 49 9.41 | 7.210 | 24 25 21.1 | 2.51 | 22 1 46.4 | 5 49 22.20 | 7.205 | 24 25 25.5 | 2.47 |
| 23 | 5 52 2.42 | 7.207 | 24 26 15.3 | 2.00 | 23 1 45.4 | 5 52 15.09 | 7.202 | 24 26 18.8 | 1.97 |
| 24 | 5 54 55.36 | 7.204 | 24 26 57.4 | 1.50 | 24 1 44.3 | 5 55 7.89 | 7.198 | 24 27 0.0 | 1.47 |
| 25 | 5 57 48.21 | 7.200 | 24 27 27.4 | 1.00 | 25 1 43.2 | 5 58 0.60 | 7.194 | 24 27 29.1 | 0.96 |
| 26 | 6 0 40.96 | 7.196 | 24 27 45.3 | + 0.50 | 26 1 42.2 | 6 0 53.21 | 7.189 | 24 27 46.1 | + 0.46 |
| 27 | 6 3 33.60 | 7.191 | 24 27 51.2 | 0.00 | 27 1 41.1 | 6 3 45.72 | 7.185 | 24 27 51.2 | − 0.04 |
| 28 | 6 6 26.15 | 7.187 | 24 27 45.1 | − 0.50 | 28 1 40.0 | 6 6 38.13 | 7.181 | 24 27 44.3 | 0.54 |
| 29 | 6 9 18.59 | 7.182 | 24 27 27.1 | 1.00 | 29 1 39.0 | 6 9 30.43 | 7.177 | 24 27 25.5 | 1.04 |
| 30 | 6 12 10.89 | 7.176 | 24 26 57.0 | 1.50 | 30 1 37.9 | 6 12 22.60 | 7.171 | 24 26 54.6 | 1.54 |
| 31 | 6 15 3.05 | 7.170 | 24 26 15.1 | 2.00 | 31 1 36.8 | 6 15 14.62 | 7.165 | 24 26 11.9 | 2.03 |
| June 1 | 6 17 55.06 | 7.164 | 24 25 21.3 | 2.50 | 1 1 35.8 | 6 18 6.49 | 7.158 | 24 25 17.2 | 2.53 |
| 2 | 6 20 46.91 | 7.157 | 24 24 15.3 | 2.99 | 2 1 34.7 | 6 20 58.20 | 7.151 | 24 24 10.7 | 3.02 |
| 3 | 6 23 38.60 | 7.150 | 24 22 57.9 | 3.47 | 3 1 33.6 | 6 23 49.75 | 7.144 | 24 22 52.5 | 3.50 |
| 4 | 6 26 30.12 | 7.143 | 24 21 28.7 | 3.96 | 4 1 32.5 | 6 26 41.13 | 7.137 | 24 21 22.6 | 3.99 |
| 5 | 6 29 21.46 | 7.135 | 24 19 47.8 | 4.45 | 5 1 31.4 | 6 29 32.33 | 7.130 | 24 19 41.0 | 4.47 |
| 6 | 6 32 12.62 | 7.128 | 24 17 55.2 | 4.93 | 6 1 30.3 | 6 32 23.35 | 7.122 | 24 17 47.7 | 4.96 |
| 7 | 6 35 3.59 | 7.120 | 24 15 51.0 | 5.42 | 7 1 29.2 | 6 35 14.18 | 7.114 | 24 15 42.9 | 5.44 |
| 8 | 6 37 54.37 | 7.112 | 24 13 35.3 | 5.90 | 8 1 28.2 | 6 38 4.83 | 7.106 | 24 13 26.6 | 5.92 |
| 9 | 6 40 44.96 | 7.104 | 24 11 7.9 | 6.38 | 9 1 27.1 | 6 40 55.27 | 7.097 | 24 10 58.6 | 6.41 |
| 10 | 6 43 35.35 | 7.095 | 24 8 28.9 | 6.86 | 10 1 26.0 | 6 43 45.52 | 7.089 | 24 8 19.0 | 6.88 |
| 11 | 6 46 25.53 | 7.086 | 24 5 38.6 | 7.33 | 11 1 24.8 | 6 46 35.56 | 7.080 | 24 5 28.2 | 7.35 |
| 12 | 6 49 15.49 | 7.077 | 24 2 37.0 | 7.81 | 12 1 23.7 | 6 49 25.37 | 7.070 | 24 2 26.0 | 7.83 |
| 13 | 6 52 5.23 | 7.068 | 23 59 23.9 | 8.28 | 13 1 22.6 | 6 52 14.97 | 7.061 | 23 59 12.5 | 8.29 |
| 14 | 6 54 54.76 | 7.059 | 23 55 59.6 | 8.75 | 14 1 21.5 | 6 55 4.35 | 7.052 | 23 55 47.7 | 8.77 |
| 15 | 6 57 44.05 | 7.049 | 23 52 24.0 | 9.21 | 15 1 20.4 | 6 57 53.49 | 7.043 | 23 52 11.6 | 9.24 |
| 16 | 7 0 33.12 | 7.039 | 23 48 37.3 | 9.68 | 16 1 19.2 | 7 0 42.42 | 7.034 | 23 48 24.5 | 9.69 |
| 17 | 7 3 21.94 | 7.029 | 23 44 39.5 | 10.14 | 17 1 18.1 | 7 3 31.09 | 7.023 | 23 44 26.3 | 10.15 |
| 18 | 7 6 10.52 | 7.018 | 23 40 30.7 | 10.60 | 18 1 17.0 | 7 6 19.52 | 7.013 | 23 40 17.1 | 10.61 |
| 19 | 7 8 58.83 | 7.007 | 23 36 10.9 | 11.05 | 19 1 15.8 | 7 9 7.69 | 7.002 | 23 35 56.9 | 11.07 |
| 20 | 7 11 46.88 | 6.996 | 23 31 40.1 | 11.51 | 20 1 14.7 | 7 11 55.59 | 6.990 | 23 31 25.7 | 11.52 |
| 21 | 7 14 34.66 | 6.985 | 23 26 58.5 | 11.96 | 21 1 13.5 | 7 14 43.23 | 6.979 | 23 26 43.8 | 11.97 |
| 22 | 7 17 22.18 | 6.974 | 23 22 6.1 | 12.41 | 22 1 12.4 | 7 17 30.60 | 6.967 | 23 21 51.1 | 12.42 |
| 23 | 7 20 9.42 | 6.962 | 23 17 3.0 | 12.85 | 23 1 11.3 | 7 20 17.69 | 6.956 | 23 16 47.7 | 17.86 |
| 24 | 7 22 56.37 | 6.950 | 23 11 49.3 | 13.29 | 24 1 10.1 | 7 23 4.49 | 6.944 | 23 11 33.7 | 13.30 |
| 25 | 7 25 43.03 | 6.938 | 23 6 25.0 | 13.73 | 25 1 8.9 | 7 25 51.00 | 6.931 | 23 6 9.2 | 13.74 |
| 26 | 7 28 29.38 | 6.925 | 23 0 50.1 | 14.17 | 26 1 7.8 | 7 28 37.20 | 6.919 | 23 0 34.1 | 14.17 |
| 27 | 7 31 15.43 | 6.912 | 22 55 4.9 | 14.60 | 27 1 6.6 | 7 31 23.10 | 6.906 | 22 54 48.7 | 14.60 |
| 28 | 7 34 1.17 | 6.899 | 22 49 9.5 | 15.02 | 28 1 5.4 | 7 34 8.69 | 6.893 | 22 48 53.1 | 15.03 |
| 29 | 7 36 46.59 | 6.886 | 22 43 4.0 | 15.45 | 29 1 4.2 | 7 36 53.96 | 6.880 | 22 42 47.4 | 15.45 |
| 30 | 7 39 31.69 | 6.873 | 22 36 48.0 | 15.87 | 30 1 3.0 | 7 39 38.91 | 6.867 | 22 36 31.3 | 15.87 |
| 31 | 7 42 16.48 | +6.859 | +22 30 22.2 | −16.28 | 31 1 1.8 | 7 42 23.55 | +6.853 | +22 30 5.4 | −16.29 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| July 1 | 7 42 16.48 | +6.859 | +22 30 22.2 | −16.28 | 1 1 1.8 | 7 42 23.55 | +6.853 | +22 30 5.4 | +16.29 |
| 2 | 7 45 0.94 | 6.846 | 22 23 46 4 | 16.70 | 2 1 0.6 | 7 45 7.86 | 6.839 | 22 23 29.5 | 16.71 |
| 3 | 7 47 45.07 | 6.832 | 22 17 0.8 | 17.11 | 3 0 59.4 | 7 47 51.84 | 6.825 | 22 16 43.8 | 17.11 |
| 4 | 7 50 28.87 | 6.818 | 22 10 5.2 | 17.52 | 4 0 58.2 | 7 50 35.49 | 6.811 | 22 9 48.2 | 17.52 |
| 5 | 7 53 12.34 | 6.804 | 22 3 0.0 | 17.92 | 5 0 57.0 | 7 53 18.81 | 6.798 | 22 2 42.9 | 17.92 |
| 6 | 7 55 55.48 | 6.790 | 21 55 45.1 | 18.32 | 6 0 55.8 | 7 56 1.79 | 6.784 | 21 55 28.0 | 18.31 |
| 7 | 7 58 38.28 | 6.776 | 21 48 20.7 | 18.72 | 7 0 54.6 | 7 58 44.44 | 6.770 | 21 48 3.6 | 18.71 |
| 8 | 8 1 20.74 | 6.762 | 21 40 46.7 | 19.11 | 8 0 53.3 | 8 1 26.75 | 6.756 | 21 40 29.7 | 19.11 |
| 9 | 8 4 2 87 | 6.748 | 21 33 3.4 | 19.50 | 9 0 52.1 | 8 4 8.73 | 6.742 | 21 32 46.4 | 19.49 |
| 10 | 8 6 44.67 | 6.735 | 21 25 10.8 | 19.88 | 10 0 50.8 | 8 6 50.38 | 6.728 | 21 24 53.9 | 19.88 |
| 11 | 8 9 26.13 | 6.721 | 21 17 9.0 | 20.27 | 11 0 49.6 | 8 9 31.68 | 6.714 | 21 16 52.2 | 20.26 |
| 12 | 8 12 7.25 | 6.706 | 21 8 58.0 | 20.65 | 12 0 48.3 | 8 12 12.65 | 6.700 | 21 8 41.3 | 20.64 |
| 13 | 8 14 48.04 | 6.692 | 21 0 38.0 | 21.02 | 13 0 47.1 | 8 14 53.29 | 6.686 | 21 0 21.4 | 21.01 |
| 14 | 8 17 28.49 | 6.678 | 20 52 8.9 | 21.39 | 14 0 45.8 | 8 17 33.59 | 6.672 | 20 51 52.6 | 21.38 |
| 15 | 8 20 8.60 | 6.664 | 20 43 31.0 | 21.76 | 15 0 44.6 | 8 20 13.55 | 6.658 | 20 43 14.9 | 21.76 |
| 16 | 8 22 48.38 | 6.650 | 20 34 44.3 | 22.13 | 16 0 43.3 | 8 22 53.17 | 6.644 | 20 34 28.3 | 22.12 |
| 17 | 8 25 27.80 | 6.636 | 20 25 48.9 | 22.49 | 17 0 42.0 | 8 25 32.44 | 6.629 | 20 25 33.1 | 22.48 |
| 18 | 8 28 6.88 | 6.620 | 20 16 44.8 | 22.85 | 18 0 40.7 | 8 28 11.37 | 6.615 | 20 16 29.3 | 22.84 |
| 19 | 8 30 45.63 | 6.607 | 20 7 32.2 | 23.20 | 19 0 39.4 | 8 30 49.97 | 6.601 | 20 7 17.0 | 23.18 |
| 20 | 8 33 24.03 | 6.593 | 19 58 11.2 | 23 55 | 20 0 38.1 | 8 33 28.22 | 6.586 | 19 57 56.3 | 23.53 |
| 21 | 8 36 2.10 | 6.579 | 19 48 42.0 | 23.89 | 21 0 36.8 | 8 36 6.13 | 6.572 | 19 48 27.4 | 23.88 |
| 22 | 8 38 39.83 | 6.565 | 19 39 4.5 | 24.23 | 22 0 35.5 | 8 38 43.70 | 6.558 | 19 38 50.2 | 24.22 |
| 23 | 8 41 17.19 | 6.550 | 19 29 18.9 | 24.57 | 23 0 34.2 | 8 41 20.92 | 6.544 | 19 29 4.8 | 24.55 |
| 24 | 8 43 54.20 | 6.535 | 19 19 25.2 | 24.90 | 24 0 32.8 | 8 43 57.78 | 6.529 | 19 19 11.5 | 24.88 |
| 25 | 8 46 30.86 | 6.520 | 19 9 23.6 | 25.23 | 25 0 31.5 | 8 46 34.29 | 6.514 | 19 9 10.4 | 25.21 |
| 26 | 8 49 7.16 | 6.505 | 18 59 14.2 | 25.55 | 26 0 30.1 | 8 49 10.45 | 6.499 | 18 59 1.4 | 25.54 |
| 27 | 8 51 43.13 | 6.491 | 18 48 57.2 | 25.87 | 27 0 28.8 | 8 51 46.25 | 6.484 | 18 48 44.8 | 25.85 |
| 28 | 8 54 18.74 | 6.477 | 18 38 32.5 | 26.18 | 28 0 27.5 | 8 54 21.71 | 6.470 | 18 38 20.6 | 26.16 |
| 29 | 8 56 54.01 | 6.462 | 18 28 0.4 | 26.49 | 29 0 26.1 | 8 56 56.83 | 6.456 | 18 27 48.9 | 26.47 |
| 30 | 8 59 28.93 | 6.447 | 18 17 20.9 | 26.80 | 30 0 24.7 | 8 59 31.60 | 6.441 | 18 17 9.9 | 26.78 |
| 31 | 9 2 3.50 | 6.433 | 18 6 34.0 | 27.10 | 31 0 23.4 | 9 2 6.01 | 6.427 | 18 6 23.5 | 27.08 |
| Aug. 1 | 9 4 37.71 | 6.418 | 17 55 39.9 | 27.40 | 1 0 22.0 | 9 4 40.07 | 6.412 | 17 55 29.9 | 27.38 |
| 2 | 9 7 11.59 | 6.404 | 17 44 38.7 | 27.70 | 2 0 20.6 | 9 7 13.79 | 6.398 | 17 44 29.2 | 27.67 |
| 3 | 9 9 45.12 | 6.390 | 17 33 30.5 | 27.99 | 3 0 19.3 | 9 9 47.17 | 6.384 | 17 33 21.5 | 27.96 |
| 4 | 9 12 18.32 | 6.376 | 17 22 15.4 | 28.27 | 4 0 17.9 | 9 12 20.22 | 6.370 | 17 22 7.0 | 28.24 |
| 5 | 9 14 51.19 | 6.363 | 17 10 53.5 | 28.55 | 5 0 16.5 | 9 14 52.93 | 6.356 | 17 10 45.7 | 28.53 |
| 6 | 9 17 23.73 | 6.349 | 16 59 24.8 | 28.83 | 6 0 15.1 | 9 17 25.32 | 6.342 | 16 59 17.6 | 28.81 |
| 7 | 9 19 55.95 | 6.336 | 16 47 49.5 | 29.11 | 7 0 13.7 | 9 19 57.39 | 6.329 | 16 47 42.9 | 29.08 |
| 8 | 9 22 27.85 | 6.323 | 16 36 7.5 | 29.38 | 8 0 12.3 | 9 22 29.14 | 6.316 | 16 36 1.5 | 29.26 |
| 9 | 9 24 59.43 | 6.310 | 16 24 19.0 | 29.65 | 9 0 10.8 | 9 25 0.57 | 6.303 | 16 24 13.6 | 29.62 |
| 10 | 9 27 30.71 | 6.297 | 16 12 24.1 | 29.92 | 10 0 9.4 | 9 27 31.70 | 6.291 | 16 12 19.4 | 29.89 |
| 11 | 9 30 1.68 | 6.284 | 16 0 23.0 | 30.18 | 11 0 8.0 | 9 30 2.53 | 6.279 | 16 0 19.0 | 30.15 |
| 12 | 9 32 32.36 | 6.272 | 15 48 15.6 | 30.44 | 12 0 6.6 | 9 32 33.05 | 6.266 | 15 48 12.3 | 30.41 |
| 13 | 9 35 2.73 | 6.259 | 15 36 2.1 | 30.69 | 13 0 5.1 | 9 35 3.27 | 6.253 | 15 35 59.5 | 30.66 |
| 14 | 9 37 32.81 | 6.247 | 15 23 42.5 | 30.94 | 14 0 3.7 | 9 37 33.20 | 6.240 | 15 23 40.6 | 30.91 |
| 15 | 9 40 2.58 | 6.234 | 15 11 17.0 | 31.18 | 15 0 2.2 | 9 40 2.81 | 6.228 | 15 11 15.8 | 31.15 |
| 16 | 9 42 32.06 | 6.222 | 14 58 45.7 | 31.42 | 16 0 0.8 | 9 42 32.14 | 6.216 | 14 58 45.2 | 31.39 |
| | | | | | 16 23 59.3 | 9 45 1.18 | 6.204 | 14 46 9.0 | 31.63 |
| 17 | 9 45 1.25 | 6.210 | 14 46 8.6 | 31.66 | 17 23 57.9 | 9 47 29.94 | 6.192 | 14 33 27.1 | 31.86 |
| 18 | 9 47 30.16 | 6.199 | 14 33 25.9 | 31.90 | 18 23 56.4 | 9 49 58.42 | 6.180 | 14 20 39.6 | 32.09 |
| 19 | 9 49 58.79 | 6.187 | 14 20 37.5 | 32.13 | 19 23 54.9 | 9 52 26.61 | 6.169 | 14 7 46.7 | 32.31 |
| 20 | 9 52 27.13 | 6.175 | 14 7 43.8 | 32.35 | 20 23 53.5 | 9 54 54.52 | 6.158 | 13 54 48.5 | 32.53 |
| 21 | 9 54 55.20 | 6.163 | 13 54 44.8 | 32.56 | 21 23 52.0 | 9 57 22.16 | 6.146 | 13 41 45.1 | 32.75 |
| 22 | 9 57 22.98 | 6.152 | 13 41 40.7 | 32.78 | 22 23 50.5 | 9 59 49.53 | 6.135 | 13 28 36.6 | 32.96 |
| 23 | 9 59 50.50 | 6.141 | 13 28 31.3 | 32.99 | 23 23 49.0 | 10 2 16.62 | 6.123 | 13 15 23.1 | 33.16 |
| 24 | 10 2 17.74 | 6.129 | 13 15 17.1 | 33.19 | 24 23 47.5 | 10 4 43.45 | 6.112 | 13 2 4.9 | 33.35 |
| 25 | 10 4 44.72 | 6.118 | 13 1 58.0 | 33.40 | 25 23 46.1 | 10 7 10.01 | 6.101 | 12 48 41.9 | 33.55 |
| 26 | 10 7 11.43 | 6.107 | 12 48 34.1 | 33.60 | 26 23 44.6 | 10 9 36.31 | 6.090 | 12 35 14.2 | 33.75 |
| 27 | 10 9 37.88 | 6.097 | 12 35 5.5 | 33.79 | 27 23 43.1 | 10 12 2.35 | 6.079 | 12 21 41.8 | 33.95 |
| 28 | 10 12 4.07 | 6.086 | 12 21 32.2 | 33.98 | 28 23 41.6 | 10 14 28.14 | 6.069 | 12 8 4.9 | 34.14 |
| 29 | 10 14 30.01 | 6.076 | 12 7 54.4 | 34.17 | 29 23 40.0 | 10 16 53.70 | 6.059 | 11 54 23.6 | 34.32 |
| 30 | 10 16 55.72 | 6.066 | 11 54 12.2 | 34.35 | 30 23 38.5 | 10 19 19.02 | 6.050 | 11 40 37.9 | 34.50 |
| 31 | 10 19 21.18 | +6.056 | +11 40 25.6 | −34.53 | 31 23 37.0 | 10 21 44.10 | +6.041 | +11 26 48.1 | −34.66 |

# MARS, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Sept. 1 | 10 21 46.42 | +6.046 | +11 26 34.8 | −34.70 | 1 23 35.5 | 10 24 8.95 | +6.031 | +11 12 54.1 | −34.83 |
| 2 | 10 24 11.41 | 6.037 | 11 12 39.9 | 34.87 | 2 23 34.0 | 10 26 33.58 | 6.022 | 10 58 56.1 | 35.00 |
| 3 | 10 26 36.20 | 6.028 | 10 58 40.9 | 35.04 | 3 23 32.4 | 10 28 58.00 | 6.013 | 10 44 54.2 | 35.16 |
| 4 | 10 29 0.77 | 6.020 | 10 44 38.0 | 35.21 | 4 23 30.9 | 10 31 22.22 | 6.005 | 10 30 48.3 | 35.33 |
| 5 | 10 31 25.14 | 6.011 | 10 30 31.1 | 35.37 | 5 23 29.3 | 10 33 46.24 | 5.997 | 10 16 38.6 | 35.48 |
| 6 | 10 33 49.31 | 6.003 | 10 16 20.4 | 35.52 | 6 23 27.8 | 10 36 10.07 | 5.989 | 10 2 25.1 | 35.63 |
| 7 | 10 36 13.29 | 5.995 | 10 2 5.9 | 35.68 | 7 23 26.2 | 10 38 33.71 | 5.981 | 9 48 8.0 | 35.78 |
| 8 | 10 38 37.08 | 5.987 | 9 47 47.8 | 35.83 | 8 23 24.7 | 10 40 57.17 | 5.974 | 9 33 47.3 | 35.93 |
| 9 | 10 41 0.69 | 5.980 | 9 33 26.1 | 35.98 | 9 23 23.2 | 10 43 20.45 | 5.966 | 9 19 23.1 | 36.08 |
| 10 | 10 43 24.12 | 5.973 | 9 19 0.9 | 36.12 | 10 23 21.6 | 10 45 43.56 | 5.959 | 9 4 55.6 | 36.22 |
| 11 | 10 45 47.38 | 5.966 | 9 4 32.4 | 36.26 | 11 23 20.0 | 10 48 6.50 | 5.952 | 8 50 24.8 | 36.35 |
| 12 | 10 48 10.47 | 5.958 | 8 50 0.5 | 36.39 | 12 23 18.5 | 10 50 29.28 | 5.945 | 8 35 50.8 | 36.48 |
| 13 | 10 50 33.40 | 5.952 | 8 35 25.5 | 36.52 | 13 23 16.9 | 10 52 51.90 | 5.939 | 8 21 13.6 | 36.61 |
| 14 | 10 52 56.17 | 5.946 | 8 20 47.3 | 36.65 | 14 23 15.4 | 10 55 14.38 | 5.933 | 8 6 33.5 | 36.74 |
| 15 | 10 55 18.80 | 5.940 | 8 6 6.1 | 36.78 | 15 23 13.8 | 10 57 36.71 | 5.928 | 7 51 50.4 | 36.86 |
| 16 | 10 57 41.28 | 5.934 | 7 51 21.9 | 36.90 | 16 23 12.2 | 10 59 58.90 | 5.922 | 7 37 4.4 | 36.97 |
| 17 | 11 0 3.62 | 5.928 | 7 36 34.9 | 37.01 | 17 23 10.6 | 11 2 20.95 | 5.916 | 7 22 15.7 | 37.08 |
| 18 | 11 2 25.82 | 5.922 | 7 21 45.2 | 37.12 | 18 23 9.1 | 11 4 42.87 | 5.911 | 7 7 24.6 | 37.18 |
| 19 | 11 4 47.89 | 5.917 | 7 6 53.0 | 37.23 | 19 23 7.5 | 11 7 4.65 | 5.905 | 6 52 31.0 | 37.28 |
| 20 | 11 7 9.82 | 5.911 | 6 51 58.4 | 37.33 | 20 23 5.9 | 11 9 26.31 | 5.900 | 6 37 35.0 | 37.38 |
| 21 | 11 9 31.63 | 5.906 | 6 37 1.3 | 37.43 | 21 23 4.3 | 11 11 47.85 | 5.895 | 6 22 36.7 | 37.47 |
| 22 | 11 11 53.32 | 5.901 | 6 22 2.0 | 37.52 | 22 23 2.8 | 11 14 9.27 | 5.890 | 6 7 36.3 | 37.56 |
| 23 | 11 14 14.89 | 5.897 | 6 7 0.5 | 37.61 | 23 23 1.2 | 11 16 30.58 | 5.886 | 5 52 33.7 | 37.65 |
| 24 | 11 16 36.35 | 5.892 | 5 51 56.8 | 37.69 | 24 22 59.6 | 11 18 51.78 | 5.881 | 5 37 29.3 | 37.73 |
| 25 | 11 18 57.71 | 5.888 | 5 36 51.3 | 37.77 | 25 22 58.0 | 11 21 12.88 | 5.877 | 5 22 22.9 | 37.81 |
| 26 | 11 21 18.96 | 5.884 | 5 21 43.8 | 37.85 | 26 22 56.4 | 11 23 33.89 | 5.874 | 5 7 14.6 | 37.88 |
| 27 | 11 23 40.11 | 5.880 | 5 6 34.5 | 37.92 | 27 22 54.8 | 11 25 54.81 | 5.870 | 4 52 4.6 | 37.95 |
| 28 | 11 26 1.19 | 5.877 | 4 51 23.4 | 38.00 | 28 22 53.2 | 11 28 15.65 | 5.867 | 4 36 53.0 | 38.02 |
| 29 | 11 28 22.19 | 5.874 | 4 36 10.7 | 38.06 | 29 22 51.7 | 11 30 36.43 | 5.865 | 4 21 39.8 | 38.08 |
| 30 | 11 30 43.12 | 5.871 | 4 20 56.4 | 38.12 | 30 22 50.1 | 11 32 57.15 | 5.862 | 4 6 25.2 | 38.13 |
| Oct. 1 | 11 33 3.99 | 5.868 | 4 5 40.7 | 38.18 | 1 22 48.5 | 11 35 17.80 | 5.859 | 3 51 9.2 | 38.19 |
| 2 | 11 35 24.79 | 5.866 | 3 50 23.7 | 38.24 | 2 22 46.9 | 11 37 38.40 | 5.857 | 3 35 51.8 | 38.25 |
| 3 | 11 37 45.55 | 5.864 | 3 35 5.2 | 38.30 | 3 22 45.3 | 11 39 58.96 | 5.856 | 3 20 33.1 | 38.30 |
| 4 | 11 40 6.26 | 5.862 | 3 19 45.4 | 38.35 | 4 22 43.7 | 11 42 19.49 | 5.855 | 3 5 13.2 | 38.35 |
| 5 | 11 42 26.95 | 5.861 | 3 4 24.4 | 38.40 | 5 22 42.1 | 11 44 39.99 | 5.853 | 2 49 52.2 | 38.39 |
| 6 | 11 44 47.60 | 5.860 | 2 49 2.3 | 38.44 | 6 22 40.5 | 11 47 0.46 | 5.852 | 2 34 30.1 | 38.43 |
| 7 | 11 47 8.23 | 5.859 | 2 33 39.2 | 38.48 | 7 22 38.9 | 11 49 20.92 | 5.852 | 2 19 7.1 | 38.47 |
| 8 | 11 49 28.84 | 5.859 | 2 18 15.1 | 38.52 | 8 22 37.3 | 11 51 41.37 | 5.852 | 2 3 43.3 | 38.50 |
| 9 | 11 51 49.45 | 5.858 | 2 2 50.3 | 38.55 | 9 22 35.7 | 11 54 1.82 | 5.852 | 1 48 18.8 | 38.53 |
| 10 | 11 54 10.05 | 5.858 | 1 47 24.7 | 38.58 | 10 22 34.1 | 11 56 22.27 | 5.852 | 1 32 53.7 | 38.55 |
| 11 | 11 56 30.66 | 5.859 | 1 31 58.6 | 38.60 | 11 22 32.5 | 11 58 42.74 | 5.853 | 1 17 28.1 | 38.57 |
| 12 | 11 58 51.28 | 5.859 | 1 16 31.9 | 38.62 | 12 22 30.9 | 12 1 3.21 | 5.853 | 1 2 2.0 | 38.59 |
| 13 | 12 1 11.91 | 5.860 | 1 1 4.7 | 38.64 | 13 22 29.3 | 12 3 23.70 | 5.854 | 0 46 35.6 | 38.60 |
| 14 | 12 3 32.55 | 5.861 | 0 45 37.2 | 38.65 | 14 22 27.7 | 12 4 54.22 | 5.855 | 0 31 8.9 | 38.61 |
| 15 | 12 5 53.23 | 5.862 | 0 30 9.5 | 38.66 | 15 22 26.1 | 12 8 4.76 | 5.856 | 0 15 42.0 | 38.62 |
| 16 | 12 8 13.93 | 5.863 | + 0 14 41.6 | 38.66 | 16 22 24.5 | 12 10 25.34 | 5.858 | + 0 0 15.1 | 38.62 |
| 17 | 12 10 34.66 | 5.865 | − 0 0 46.3 | 38.66 | 17 22 22.9 | 12 12 45.95 | 5.860 | − 0 15 11.7 | 38.61 |
| 18 | 12 12 55.43 | 5.866 | 0 16 14.1 | 38.65 | 18 22 21.3 | 12 15 6.61 | 5.862 | 0 30 38.3 | 38.60 |
| 19 | 12 15 16.25 | 5.868 | 0 31 41.7 | 38.65 | 19 22 19.7 | 12 17 27.30 | 5.864 | 0 46 4.6 | 38.59 |
| 20 | 12 17 37.10 | 5.870 | 0 47 9.0 | 38.63 | 20 22 18.1 | 12 19 48.05 | 5.866 | 1 1 30.5 | 38.57 |
| 21 | 12 19 58.01 | 5.872 | 1 2 35.9 | 38.61 | 21 22 16.5 | 12 22 8.86 | 5.868 | 1 16 56.0 | 38.55 |
| 22 | 12 22 18.98 | 5.875 | 1 18 2.4 | 38.59 | 22 22 15.0 | 12 24 29.72 | 5.871 | 1 32 20.9 | 38.52 |
| 23 | 12 24 40.00 | 5.877 | 1 33 28.3 | 38.56 | 23 22 13.4 | 12 26 50.65 | 5.874 | 1 47 45.1 | 38.49 |
| 24 | 12 27 1.09 | 5.880 | 1 48 53.4 | 38.53 | 24 22 11.8 | 12 29 11.66 | 5.877 | 2 3 8.5 | 38.46 |
| 25 | 12 29 22.26 | 5.884 | 2 4 17.9 | 38.50 | 25 22 10.2 | 12 31 32.75 | 5.880 | 2 18 31.1 | 38.42 |
| 26 | 12 31 43.52 | 5.887 | 2 19 41.4 | 38.46 | 26 22 8.6 | 12 33 53.92 | 5.884 | 2 33 52.7 | 38.38 |
| 27 | 12 34 4.86 | 5.891 | 2 35 4.0 | 38.42 | 27 22 7.0 | 12 36 15.18 | 5.888 | 2 49 13.3 | 38.33 |
| 28 | 12 36 26.28 | 5.895 | 2 50 25.6 | 38.37 | 28 22 5.5 | 12 38 36.55 | 5.893 | 3 4 32.9 | 38.28 |
| 29 | 12 38 47.81 | 5.899 | 3 5 46.1 | 38.32 | 29 22 3.9 | 12 40 58.03 | 5.897 | 3 19 51.2 | 38.23 |
| 30 | 12 41 9.45 | 5.904 | 3 21 5.3 | 38.27 | 30 22 2.3 | 12 43 19.61 | 5.902 | 3 35 8.2 | 38.18 |
| 31 | 12 43 31.20 | 5.909 | 3 36 23.2 | 38.22 | 31 22 0.7 | 12 45 41.32 | 5.908 | 3 50 24.0 | 38.12 |
| 32 | 12 45 53.07 | +5.913 | − 3 51 39.9 | −38.16 | 32 21 59.2 | 12 48 3.16 | +5.913 | − 4 5 38.2 | −38.06 |

# MARS, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Nov. 1 | 12 45 53.07 | +5.913 | - 3 51 39.9 | -38.16 | 1 21 59.2 | 12 48 3.16 | +5.913 | - 4 5 38.2 | -38.06 |
| 2 | 12 48 15.07 | 5.919 | 4 6 55.0 | 38.10 | 2 21 57.6 | 12 50 25.13 | 5.919 | 4 20 50.9 | 38.00 |
| 3 | 12 50 37.21 | 5.925 | 4 22 8.6 | 38.03 | 3 21 56.0 | 12 52 47.24 | 5.925 | 4 36 2.2 | 37.94 |
| 4 | 12 52 59.49 | 5.931 | 4 37 20.7 | 37.97 | 4 21 54.4 | 12 55 9.49 | 5.931 | 4 51 11.7 | 37.87 |
| 5 | 12 55 21.90 | 5.938 | 4 52 31.1 | 97.89 | 5 21 52.9 | 12 57 31.90 | 5.937 | 5 6 19.5 | 37.79 |
| 6 | 12 57 44.50 | 5.944 | 5 7 39.6 | 37.82 | 6 21 51.3 | 12 59 54.48 | 5.944 | 5 21 25.4 | 37.70 |
| 7 | 13 0 7.24 | 5.951 | 5 22 46.3 | 37.74 | 7 21 49.7 | 13 2 17.24 | 5.951 | 5 36 29.2 | 37.61 |
| 8 | 13 2 30.17 | 5.958 | 5 37 50.9 | 37.65 | 8 21 48.2 | 13 4 40.16 | 5.958 | 5 51 30.9 | 37.52 |
| 9 | 13 4 53.26 | 5.966 | 5 52 53.5 | 37.56 | 9 21 46.6 | 13 7 3.25 | 5.966 | 6 6 30.5 | 37.43 |
| 10 | 13 7 16.53 | 5.973 | 6 7 53.8 | 37.47 | 10 21 45.1 | 13 9 26.53 | 5.973 | 6 21 27.8 | 37.33 |
| 11 | 13 9 39.97 | 5.981 | 6 22 51.8 | 37.37 | 11 21 43.5 | 13 11 49.99 | 5.981 | 6 36 22.6 | 37.23 |
| 12 | 13 12 3.61 | 5.988 | 6 37 47.3 | 37.26 | 12 21 42.0 | 13 14 13.64 | 5.989 | 6 51 14.9 | 37.12 |
| 13 | 13 14 27.43 | 5.996 | 6 52 40.3 | 37.15 | 13 21 40.4 | 13 16 37.48 | 5.997 | 7 6 4.6 | 37.01 |
| 14 | 13 16 51.44 | 6.004 | 7 7 30.7 | 37.04 | 14 21 38.9 | 13 19 1.51 | 6.005 | 7 20 51.5 | 36.89 |
| 15 | 13 19 15.64 | 6.013 | 7 22 18.3 | 36.92 | 15 21 37.4 | 13 21 25.74 | 6.014 | 7 35 35.5 | 36.77 |
| 16 | 13 21 40.05 | 6.021 | 7 37 3.0 | 36.80 | 16 21 35.8 | 13 23 50.18 | 6.023 | 7 50 16.6 | 36.65 |
| 17 | 13 24 4.66 | 6.029 | 7 51 44.7 | 36.67 | 17 21 34.3 | 13 26 14.82 | 6.031 | 8 4 54.7 | 36.52 |
| 18 | 13 26 29.48 | 6.038 | 8 6 23.4 | 36.54 | 18 21 32.8 | 13 28 39.67 | 6.040 | 8 19 29.5 | 36.38 |
| 19 | 13 28 54.50 | 6.047 | 8 20 58.8 | 36.41 | 19 21 31.3 | 13 31 4.73 | 6.049 | 8 34 1.0 | 36.24 |
| 20 | 13 31 19.74 | 6.056 | 8 35 30.9 | 36.27 | 20 21 29.7 | 13 33 30.02 | 6.058 | 8 48 29.1 | 36.10 |
| 21 | 13 33 45.20 | 6.065 | 8 49 59.6 | 36.12 | 21 21 28.2 | 13 35 55.53 | 6.067 | 9 2 53.9 | 35.95 |
| 22 | 13 36 10.89 | 6.075 | 9 4 24.9 | 35.97 | 22 21 26.7 | 13 38 21.26 | 6.076 | 9 17 15.0 | 35.80 |
| 23 | 13 38 36.80 | 6.083 | 9 18 46.5 | 35.82 | 23 21 25.2 | 13 40 47.22 | 6.086 | 9 31 32.4 | 35.65 |
| 24 | 13 41 2.94 | 6.094 | 9 33 4.5 | 35.67 | 24 21 23.7 | 13 43 13.42 | 6.097 | 9 45 46.2 | 35.49 |
| 25 | 13 43 29.32 | 6.104 | 9 47 18.7 | 35.51 | 25 21 22.2 | 13 45 39.87 | 6.107 | 9 59 56.0 | 35.33 |
| 26 | 13 45 55.95 | 6.115 | 10 1 29.0 | 35.35 | 26 21 20.7 | 13 48 6.57 | 6.118 | 10 14 1.9 | 35.16 |
| 27 | 13 48 22.83 | 6 125 | 10 15 35.3 | 35.18 | 27 21 19.2 | 13 50 33.53 | 6.129 | 10 28 3.8 | 34.99 |
| 28 | 13 50 49.97 | 6.136 | 10 29 37.6 | 35.01 | 28 21 17.7 | 13 53 0.74 | 6.140 | 10 42 1.5 | 34.82 |
| 29 | 13 53 17.36 | 6.147 | 10 43 35.7 | 34.83 | 29 21 16.3 | 13 55 28.22 | 6.151 | 10 55 55.0 | 34.62 |
| 30 | 13 55 45.03 | 6.158 | 10 57 29.5 | 34.65 | 30 21 14.8 | 13 57 55.97 | 6.162 | 11 9 44.2 | 34.45 |
| Dec. 1 | 13 58 12.96 | 6.170 | 11 11 19.1 | 34.47 | 1 21 13.3 | 14 0 23.99 | 6.174 | 11 23 29.0 | 34.27 |
| 2 | 14 0 41.17 | 6.181 | 11 25 4.2 | 34.28 | 2 21 11.9 | 14 2 52.31 | 6.186 | 11 37 9.3 | 34.09 |
| 3 | 14 3 9.67 | 6.193 | 11 38 44.8 | 34.10 | 3 21 10.4 | 14 5 20.92 | 6.198 | 11 50 45.0 | 33.89 |
| 4 | 14 5 38.46 | 6.206 | 11 52 20.8 | 33.90 | 4 21 8.9 | 14 7 49.81 | 6.210 | 12 4 16.0 | 33.69 |
| 5 | 14 8 7.54 | 6.218 | 12 5 52.1 | 33.70 | 5 21 7.5 | 14 10 19.00 | 6.222 | 12 17 42.2 | 33.49 |
| 6 | 14 10 36.91 | 6.230 | 12 19 18.5 | 33.50 | 6 21 6.1 | 14 12 48.49 | 6.235 | 12 31 3.6 | 33.28 |
| 7 | 14 13 6.59 | 6.243 | 12 32 40.1 | 33.29 | 7 21 4.6 | 14 15 18.28 | 6.248 | 12 44 19.9 | 33.07 |
| 8 | 14 15 36.57 | 6.255 | 12 45 56.5 | 33.08 | 8 21 3.2 | 14 17 48.38 | 6.261 | 12 57 31.0 | 32.86 |
| 9 | 14 18 6.85 | 6.268 | 12 59 7.8 | 32.86 | 9 21 1.7 | 14 20 18.79 | 6.274 | 13 10 36.9 | 32.63 |
| 10 | 14 20 37.45 | 6.281 | 13 12 13.8 | 32.64 | 10 21 0.3 | 14 22 49.51 | 6.287 | 13 23 37.4 | 32.31 |
| 11 | 14 23 8.36 | 6.294 | 13 25 14.4 | 32.41 | 11 20 58.9 | 14 25 20.54 | 6.300 | 13 36 32.4 | 32.18 |
| 12 | 14 25 39.57 | 6.307 | 13 38 9.5 | 32.18 | 12 20 57.5 | 14 27 51.87 | 6.312 | 13 49 21.9 | 31.95 |
| 13 | 14 28 11.09 | 6.320 | 13 50 59.2 | 31.95 | 13 20 56.1 | 14 30 23.51 | 6.324 | 14 2 5.8 | 31.71 |
| 14 | 14 30 42.92 | 6.332 | 14 3 43.0 | 31.70 | 14 20 54.7 | 14 32 55.46 | 6.337 | 14 14 43.9 | 31.46 |
| 15 | 14 33 15.06 | 6.346 | 14 16 21.0 | 31.46 | 15 20 53.3 | 14 35 27.72 | 6.351 | 14 27 15.9 | 31.21 |
| 16 | 14 35 47.51 | 6.359 | 14 28 52.9 | 31.20 | 16 20 51.9 | 14 38 0.30 | 6.364 | 14 39 41.8 | 30.95 |
| 17 | 14 38 20.28 | 6.372 | 14 41 18.8 | 30.95 | 17 20 50.5 | 14 40 33.20 | 6.377 | 14 52 1.5 | 30.69 |
| 18 | 14 40 53.37 | 6.385 | 14 53 38.4 | 30.69 | 18 20 49.1 | 14 43 6.41 | 6.390 | 15 4 15.0 | 30.43 |
| 19 | 14 43 26.77 | 6.398 | 15 5 51.8 | 30.44 | 19 20 47.7 | 14 45 39.94 | 6.404 | 15 16 22.2 | 30.17 |
| 20 | 14 46 0.49 | 6.412 | 15 17 58.8 | 30.16 | 20 20 46.3 | 14 48 13.78 | 6.417 | 15 28 23.0 | 29.90 |
| 21 | 14 48 34.52 | 6.425 | 15 29 59.4 | 29.89 | 21 20 44.9 | 14 50 47.95 | 6.430 | 15 40 17.2 | 29.62 |
| 22 | 14 51 8.88 | 6.438 | 15 41 53.4 | 29.61 | 22 20 43.6 | 14 53 22.44 | 6.443 | 15 52 4.7 | 29.34 |
| 23 | 14 53 43.56 | 6.452 | 15 53 40.8 | 29.33 | 23 20 42.2 | 14 55 57.25 | 6.457 | 16 3 45.5 | 29.06 |
| 24 | 14 56 18.56 | 6.465 | 16 5 21.4 | 29.05 | 24 20 40.9 | 14 58 32.38 | 6.470 | 16 15 19.6 | 28.77 |
| 25 | 14 58 53.89 | 6.479 | 16 16 55.1 | 28.76 | 25 20 39.5 | 15 1 7.84 | 6.484 | 16 26 46.6 | 28.48 |
| 26 | 15 1 29.53 | 6.492 | 16 28 21.8 | 28.47 | 26 20 38.2 | 15 3 43.63 | 6.499 | 16 38 6.6 | 28.18 |
| 27 | 15 4 5.51 | 6.506 | 16 39 41.5 | 28.17 | 27 20 36.8 | 15 6 19.77 | 6.513 | 16 49 19.6 | 27.89 |
| 28 | 15 6 41.84 | 6.520 | 16 50 54.1 | 27.87 | 28 20 35.5 | 15 8 56.23 | 6 526 | 17 0 25.5 | 27.59 |
| 29 | 15 9 18.49 | 6.534 | 17 1 59.6 | 27.57 | 29 20 34.2 | 15 11 33.02 | 6.540 | 17 11 24.0 | 27.29 |
| 30 | 15 11 55.48 | 6.548 | 17 12 57.6 | 27.27 | 30 20 32.9 | 15 14 10.15 | 6.553 | 17 22 15.2 | 26.98 |
| 31 | 15 14 32.80 | 6.563 | 17 23 48.3 | 26.96 | 31 20 31.6 | 15 16 47.64 | 6.569 | 17 32 58.9 | 26.67 |
| 32 | 15 17 10.49 | +6.578 | -17 34 31.5 | -26.64 | 32 20 30.3 | 15 19 25.49 | +6.584 | -17 43 34.9 | -26.34 |

# JUPITER, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Jan. 0 | 15 27 13 86 | +1.875 | -17 52 14.6 | -6.67 | 0 20 45.6 | 15 27 52.68 | +1.860 | -17 54 32.3 | -6.59 |
| 1 | 15 27 58.70 | 1.862 | 17 54 53.7 | 6.59 | 1 20 42.4 | 15 28 37.15 | 1.846 | 17 57 9.4 | 6.50 |
| 2 | 15 28 43.23 | 1.849 | 17 57 30.8 | 6.51 | 2 20 39.2 | 15 29 21.30 | 1.833 | 17 59 44.4 | 6.42 |
| 3 | 15 29 27.45 | 1.836 | 18 0 5.9 | 6.43 | 3 20 36.0 | 15 30 5.14 | 1.819 | 18 2 17.4 | 6.34 |
| 4 | 15 30 11.34 | 1.822 | 18 2 38.9 | 6.34 | 4 20 32.8 | 15 30 48.65 | 1.805 | 18 4 48.4 | 6.26 |
| 5 | 15 30 54.89 | 1 808 | 18 5 10.0 | 6.25 | 5 20 29.6 | 15 31 31.81 | 1.791 | 18 7 17.5 | 6.17 |
| 6 | 15 31 38.10 | 1.794 | 18 7 39.1 | 6.17 | 6 20 26.4 | 15 32 14.62 | 1.776 | 18 9 44.5 | 6.09 |
| 7 | 15 32 20.95 | 1.779 | 18 10 6.2 | 6.09 | 7 20 23.2 | 15 32 57.07 | 1.761 | 18 12 9.5 | 6.00 |
| 8 | 15 33 3.45 | 1.764 | 18 12 31.2 | 6.00 | 8 20 20.0 | 15 33 39.17 | 1.746 | 18 14 32.5 | 5.92 |
| 9 | 15 33 45.59 | 1.749 | 18 14 54.2 | 5.92 | 9 20 16.8 | 15 34 20.90 | 1.731 | 18 16 53.5 | 5.84 |
| 10 | 15 34 27.36 | 1.733 | 18 17 15.2 | 5.83 | 10 20 13.5 | 15 35 2.26 | 1.715 | 18 19 12.4 | 5.75 |
| 11 | 15 35 8.75 | 1.717 | 18 19 34.1 | 5.75 | 11 20 10.2 | 15 35 43.24 | 1.699 | 18 21 29.3 | 5.67 |
| 12 | 15 35 49.75 | 1.700 | 18 21 51.0 | 5.67 | 12 20 6.9 | 15 36 23.82 | 1.683 | 18 23 44.1 | 5.59 |
| 13 | 15 36 30.37 | 1.684 | 18 24 5.8 | 5.58 | 13 20 3.7 | 15 37 4.01 | 1.666 | 18 25 56.9 | 5.50 |
| 14 | 15 37 10.59 | 1.667 | 18 26 18.5 | 5.49 | 14 20 0.4 | 15 37 43.80 | 1.649 | 18 28 7.5 | 5.41 |
| 15 | 15 37 50.41 | 1.650 | 18 28 29.1 | 5.40 | 15 19 57.1 | 15 38 23.19 | 1.632 | 18 30 16.1 | 5.32 |
| 16 | 15 38 29.81 | 1.633 | 18 30 37.7 | 5.32 | 16 19 53.8 | 15 39 2.15 | 1.614 | 18 32 22.7 | 5.24 |
| 17 | 15 39 8.79 | 1.615 | 18 32 44.2 | 5.23 | 17 19 50.5 | 15 39 40.69 | 1.596 | 18 34 27.2 | 5.15 |
| 18 | 15 39 47.34 | 1.597 | 18 34 48.6 | 5.14 | 18 19 47.2 | 15 40 18.79 | 1.578 | 18 36 29.5 | 5.06 |
| 19 | 15 40 25.44 | 1.579 | 18 36 50.8 | 5.05 | 19 19 43.9 | 15 40 56.44 | 1.559 | 18 38 29.7 | 4.97 |
| 20 | 15 41 3.10 | 1.560 | 18 38 50.9 | 4.96 | 20 19 40.6 | 15 41 33.64 | 1.540 | 18 40 27.8 | 4.88 |
| 21 | 15 41 40.31 | 1.541 | 18 40 48.9 | 4.87 | 21 19 37.3 | 15 42 10.38 | 1.521 | 18 42 23.8 | 4.79 |
| 22 | 15 42 17.06 | 1.521 | 18 42 44.8 | 4.78 | 22 19 34.0 | 15 42 46.66 | 1.501 | 18 44 17.7 | 4.70 |
| 23 | 15 42 53.33 | 1.501 | 18 44 38.6 | 4.69 | 23 19 30.7 | 15 43 22.46 | 1.481 | 18 46 9.5 | 4.61 |
| 24 | 15 43 29.12 | 1.481 | 18 46 30.2 | 4.60 | 24 19 27.4 | 15 43 57.77 | 1.461 | 18 47 59.1 | 4.52 |
| 25 | 15 44 4.42 | 1.460 | 18 48 19.6 | 4.51 | 25 19 24.0 | 15 44 32.59 | 1.440 | 18 49 46.5 | 4.43 |
| 26 | 15 44 39.22 | 1.439 | 18 50 6.8 | 4.42 | 26 19 20.6 | 15 45 6.90 | 1.419 | 18 51 31.7 | 4.34 |
| 27 | 15 45 13.52 | 1.418 | 18 51 51.8 | 4.33 | 27 19 17.2 | 15 45 40.71 | 1.397 | 18 53 14.7 | 4.25 |
| 28 | 15 45 47.31 | 1.397 | 18 53 34.7 | 4.24 | 28 19 13.8 | 15 46 14.01 | 1.375 | 18 54 55.6 | 4.16 |
| 29 | 15 46 20.57 | 1.375 | 18 55 15.4 | 4.15 | 29 19 10.4 | 15 46 46.77 | 1.353 | 18 56 34.4 | 4.07 |
| 30 | 15 46 53.30 | 1.353 | 18 56 53.9 | 4.06 | 30 19 7.0 | 15 47 18.99 | 1.331 | 18 58 10.9 | 3.98 |
| 31 | 15 47 25.50 | 1.331 | 18 58 30.2 | 3.97 | 31 19 3.6 | 15 47 50.68 | 1.308 | 18 59 45.2 | 3.89 |
| Feb. 1 | 15 47 57.15 | 1.308 | 19 0 4.3 | 3.88 | 1 19 0.2 | 15 48 21.82 | 1.285 | 19 1 17.3 | 3.80 |
| 2 | 15 48 28.25 | 1.285 | 19 1 36.3 | 3.79 | 2 18 56.8 | 15 48 52.41 | 1.262 | 19 2 47.3 | 3.70 |
| 3 | 15 48 58.79 | 1.261 | 19 3 6.1 | 3.70 | 3 18 53.3 | 15 49 22.43 | 1.239 | 19 4 15.2 | 3.61 |
| 4 | 15 49 28.77 | 1.237 | 19 4 33.6 | 3.60 | 4 18 49.8 | 15 49 51.89 | 1.215 | 19 5 40.8 | 3.52 |
| 5 | 15 49 58.17 | 1.213 | 19 5 59.0 | 3.51 | 5 18 46.3 | 15 50 20.77 | 1.191 | 19 7 4.3 | 3.43 |
| 6 | 15 50 27.00 | 1.189 | 19 7 22.2 | 3.42 | 6 18 42.9 | 15 50 49.08 | 1.167 | 19 8 25.6 | 3.34 |
| 7 | 15 50 55.24 | 1.165 | 19 8 43.3 | 3.33 | 7 18 39.4 | 15 51 16.79 | 1.142 | 19 9 44.8 | 3.25 |
| 8 | 15 51 22.89 | 1.140 | 19 10 2.2 | 3.24 | 8 18 35.9 | 15 51 43.91 | 1.117 | 19 11 1.8 | 3.16 |
| 9 | 15 51 49.94 | 1.115 | 19 11 18.9 | 3.15 | 9 18 32.4 | 15 52 10.43 | 1.092 | 19 12 16.6 | 3.07 |
| 10 | 15 52 16.39 | 1.090 | 19 12 33.4 | 3.06 | 10 18 28.9 | 15 52 36.34 | 1.067 | 19 13 29.2 | 2.98 |
| 11 | 15 52 42.23 | 1.064 | 19 13 45.7 | 2.97 | 11 18 25.4 | 15 53 1.64 | 1.041 | 19 14 39.7 | 2.89 |
| 12 | 15 53 7.46 | 1.038 | 19 14 55.9 | 2.88 | 12 18 21.9 | 15 53 26.33 | 1.015 | 19 15 48.0 | 2.80 |
| 13 | 15 53 32.05 | 1.012 | 19 16 3.9 | 2.79 | 13 18 18.4 | 15 53 50.38 | 0.989 | 19 16 54.2 | 2.91 |
| 14 | 15 53 56.00 | 0.985 | 19 17 9.6 | 2.69 | 14 18 14.9 | 15 54 13.78 | 0.962 | 19 17 58.1 | 2.62 |
| 15 | 15 54 19.31 | 0.958 | 19 18 13.1 | 2.60 | 15 18 11.4 | 15 54 36.54 | 0.935 | 19 18 59.8 | 2.53 |
| 16 | 15 54 41.96 | 0.931 | 19 19 14.5 | 2.50 | 16 18 7.8 | 15 54 58.64 | 0.907 | 19 19 59.4 | 2.44 |
| 17 | 15 55 3.96 | 0.903 | 19 20 13.6 | 2.41 | 17 18 4.2 | 15 55 20.09 | 0.879 | 19 20 56.7 | 2.35 |
| 18 | 15 55 25.30 | 0.875 | 19 21 10.5 | 2.32 | 18 18 0.6 | 15 55 40.87 | 0.851 | 19 21 51.8 | 2.26 |
| 19 | 15 55 45.96 | 0.847 | 19 22 5.2 | 2.23 | 19 17 57.0 | 15 56 0.97 | 0.823 | 19 22 44.7 | 2.16 |
| 20 | 15 56 5.94 | 0.819 | 19 22 57.7 | 2.14 | 20 17 53.4 | 15 56 20.39 | 0.794 | 19 23 35.4 | 2.07 |
| 21 | 15 56 25.24 | 0.790 | 19 23 47.9 | 2.05 | 21 17 49.8 | 15 56 39.13 | 0.765 | 19 24 23.8 | 1.98 |
| 22 | 15 56 43.84 | 0.761 | 19 24 35.9 | 1.95 | 22 17 46.2 | 15 56 57.17 | 0.736 | 19 25 10.0 | 1.89 |
| 23 | 15 57 1.74 | 0.731 | 19 25 21.7 | 1.86 | 23 17 42.6 | 15 57 14.50 | 0.707 | 19 25 54.0 | 1.80 |
| 24 | 15 57 18.92 | 0.701 | 19 26 5.3 | 1.77 | 24 17 38.9 | 15 57 31.11 | 0.677 | 19 26 35.9 | 1.70 |
| 25 | 15 57 35.40 | 0.671 | 19 26 46.6 | 1.68 | 25 17 35.2 | 15 57 47.02 | 0.647 | 19 27 15.5 | 1.61 |
| 26 | 15 57 51.16 | 0.641 | 19 27 25.7 | 1.59 | 26 17 31.5 | 15 58 2.21 | 0.617 | 19 27 52.9 | 1.52 |
| 27 | 15 58 6.19 | 0.611 | 19 28 2.6 | 1.50 | 27 17 27.8 | 15 58 16.67 | 0.587 | 19 28 28.1 | 1.43 |
| 28 | 15 58 20.49 | 0.581 | 19 28 37.2 | 1.40 | 28 17 24.1 | 15 58 30.40 | 0.557 | 19 29 1.0 | 1.34 |
| 29 | 15 58 34.06 | 0 550 | 19 29 9.7 | 1.31 | 29 17 20.4 | 15 58 43.41 | 0.526 | 19 29 31.8 | 1.24 |
| 30 | 15 58 46.89 | +0.519 | -19 29 39.9 | -1.22 | 30 17 16.7 | 15 58 55.67 | +0.495 | -19 30 0.3 | -1.15 |

# JUPITER, 1876..

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Mar. 1 | 15 58 46.89 | +0.519 | −19 29 39.9 | −1.22 | 1 17 16.7 | 15 58 55.67 | +0.495 | −19 30 0.3 | −1.15 |
| 2 | 15 58 58.98 | 0.488 | 19 30 7.9 | 1.13 | 2 17 13.0 | 15 59 7.19 | 0.464 | 19 30 26.6 | 1.06 |
| 3 | 15 59 10.33 | 0.457 | 19 30 33.8 | 1.03 | 3 17 9.3 | 15 59 17.98 | 0.433 | 19 30 50.9 | 0.96 |
| 4 | 15 59 20.93 | 0.426 | 19 30 57.4 | 0.94 | 4 17 5.5 | 15 59 28.02 | 0.402 | 19 31 12.9 | 0.87 |
| 5 | 15 59 30.78 | 0.395 | 19 31 18.8 | 0.85 | 5 17 1.7 | 15 59 37.31 | 0.371 | 19 31 32.7 | 0.78 |
| 6 | 15 59 39.87 | 0.364 | 19 31 38.0 | 0.76 | 6 16 57.9 | 15 59 45.84 | 0.340 | 19 31 50.3 | 0.69 |
| 7 | 15 59 48.19 | 0.332 | 19 31 55.1 | 0.67 | 7 16 54.1 | 15 59 53.60 | 0.309 | 19 32 5.8 | 0.60 |
| 8 | 15 59 55.76 | 0.300 | 19 32 10.0 | 0.58 | 8 16 50.3 | 16 0 0.61 | 0.277 | 19 32 19.1 | 0.50 |
| 9 | 16 0 2.56 | 0.268 | 19 32 22.7 | 0.48 | 9 16 46.5 | 16 0 6.86 | 0.245 | 19 32 30.2 | 0.41 |
| 10 | 16 0 8.60 | 0.236 | 19 32 33.2 | 0.39 | 10 16 42.7 | 16 0 12.35 | 0.213 | 19 32 39.1 | 0.32 |
| 11 | 16 0 13.87 | 0.204 | 19 32 41.4 | 0.30 | 11 16 38.8 | 16 0 17.07 | 0.181 | 19 32 45.8 | 0.23 |
| 12 | 16 0 18.37 | 0.172 | 19 32 47.4 | 0.20 | 12 16 34.9 | 16 0 21.03 | 0.149 | 19 32 50.3 | 0.14 |
| 13 | 16 0 22.10 | 0.140 | 19 32 51.3 | 0.11 | 13 16 31.0 | 16 0 24.22 | 0.117 | 19 32 52.7 | −0.05 |
| 14 | 16 0 25.05 | 0.107 | 19 32 53.0 | −0.02 | 14 16 27.1 | 16 0 26.63 | 0.085 | 19 32 52.9 | +0.04 |
| 15 | 16 0 27.22 | 0.074 | 19 32 52.5 | +0.07 | 15 16 23.2 | 16 0 28.26 | 0.052 | 19 32 50.9 | 0.13 |
| 16 | 16 0 28.61 | 0.042 | 19 32 49.8 | 0.16 | 16 16 19.3 | 16 0 29.11 | +0.019 | 19 32 46.7 | 0.22 |
| 17 | 16 0 29.21 | +0.010 | 19 32 44.9 | 0.25 | 17 16 15.4 | 16 0 29.18 | −0.014 | 19 32 40.3 | 0.31 |
| 18 | 16 0 29.03 | −0.023 | 19 32 37.8 | 0.34 | 18 16 11.5 | 16 0 28.47 | 0.046 | 19 32 31.8 | 0.40 |
| 19 | 16 0 28.06 | 0.056 | 19 32 28.6 | 0.43 | 19 16 7.5 | 16 0 26.97 | 0.078 | 19 32 21.1 | 0.49 |
| 20 | 16 0 26.31 | 0.089 | 19 32 17.2 | 0.52 | 20 16 3.5 | 16 0 24.70 | 0.111 | 19 32 8.3 | 0.58 |
| 21 | 16 0 23.77 | 0.122 | 19 32 3.6 | 0.61 | 21 15 59.5 | 16 0 21.65 | 0.144 | 19 31 53.3 | 0.67 |
| 22 | 16 0 20.45 | 0.155 | 19 31 47.8 | 0.70 | 22 15 55.5 | 16 0 17.82 | 0.177 | 19 31 36.1 | 0.76 |
| 23 | 16 0 16.35 | 0.188 | 19 31 29.8 | 0.79 | 23 15 51.5 | 16 0 13.21 | 0.209 | 19 31 16.7 | 0.85 |
| 24 | 16 0 11.46 | 0.220 | 19 31 9.6 | 0.88 | 24 15 47.5 | 16 0 7.82 | 0.241 | 19 30 55.2 | 0.94 |
| 25 | 16 0 5.79 | 0.252 | 19 30 47.3 | 0.97 | 25 15 43.5 | 16 0 1.65 | 0.273 | 19 30 31.5 | 1.03 |
| 26 | 15 59 59.34 | 0.284 | 19 30 22.8 | 1.06 | 26 15 39.5 | 15 59 54.73 | 0.305 | 19 30 5.7 | 1.12 |
| 27 | 15 59 52.11 | 0.316 | 19 29 56.3 | 1.15 | 27 15 35.4 | 15 59 47.02 | 0.337 | 19 29 37.9 | 1.20 |
| 28 | 15 59 44.12 | 0.348 | 19 29 27.7 | 1.24 | 28 15 31.3 | 15 59 38.55 | 0.369 | 19 29 8.0 | 1.29 |
| 29 | 15 59 35.37 | 0.380 | 19 28 56.9 | 1.33 | 29 15 27.2 | 15 59 29.34 | 0.400 | 19 28 35.9 | 1.38 |
| 30 | 15 59 25.86 | 0.412 | 19 28 24.0 | 1.41 | 30 15 23.1 | 15 59 19.38 | 0.431 | 19 28 1.8 | 1.46 |
| 31 | 15 59 15.60 | 0.443 | 19 27 49.0 | 1.50 | 31 15 19.0 | 15 59 8.67 | 0.462 | 19 27 25.6 | 1.55 |
| Apr. 1 | 15 59 4.59 | 0.474 | 19 27 12.0 | 1.59 | 1 15 14.9 | 15 58 57.22 | 0.493 | 19 26 47.4 | 1.64 |
| 2 | 15 58 52.85 | 0.505 | 19 26 32.9 | 1.67 | 2 15 10.8 | 15 58 45.05 | 0.523 | 19 26 7.1 | 1.72 |
| 3 | 15 58 40.37 | 0.535 | 19 25 51.8 | 1.75 | 3 15 6.7 | 15 58 32.15 | 0.553 | 19 25 24.9 | 1.80 |
| 4 | 15 58 27.17 | 0.565 | 19 25 8.8 | 1.83 | 4 15 2.5 | 15 58 18.54 | 0.582 | 19 24 40.8 | 1.88 |
| 5 | 15 58 13.26 | 0.595 | 19 24 23.8 | 1.92 | 5 14 58.3 | 15 58 4.22 | 0.611 | 19 23 54.7 | 1.97 |
| 6 | 15 57 58.64 | 0.624 | 19 23 36.8 | 2.00 | 6 14 54.1 | 15 57 49.21 | 0.640 | 19 23 6.6 | 2.05 |
| 7 | 15 57 43.32 | 0.653 | 19 22 47.8 | 2.08 | 7 14 49.9 | 15 57 33.51 | 0.669 | 19 22 16.5 | 2.13 |
| 8 | 15 57 27.31 | 0.682 | 19 21 56.8 | 2.16 | 8 14 45.7 | 15 57 17.13 | 0.697 | 19 21 24.5 | 2.21 |
| 9 | 15 57 10.61 | 0.710 | 19 21 3.9 | 2.24 | 9 14 41.5 | 15 57 0.06 | 0.725 | 19 20 30.6 | 2.29 |
| 10 | 15 56 53.24 | 0.738 | 19 20 9.1 | 2.32 | 10 14 37.3 | 15 56 42.34 | 0.752 | 19 19 34.8 | 2.37 |
| 11 | 15 56 35.21 | 0.765 | 19 19 12.4 | 2.40 | 11 14 33.1 | 15 56 23.97 | 0.779 | 19 18 37.1 | 2.45 |
| 12 | 15 56 16.52 | 0.792 | 19 18 13.7 | 2.48 | 12 14 28.9 | 15 56 4.94 | 0.806 | 19 17 37.4 | 2.53 |
| 13 | 15 55 57.19 | 0.819 | 19 17 13.2 | 2.56 | 13 14 24.6 | 15 55 45.28 | 0.832 | 19 16 36.0 | 2.60 |
| 14 | 15 55 37.22 | 0.845 | 19 16 10.9 | 2.63 | 14 14 20.3 | 15 55 25.00 | 0.858 | 19 15 32.8 | 2.67 |
| 15 | 15 55 16.63 | 0.870 | 19 15 6.8 | 2.70 | 15 14 16.0 | 15 55 4.11 | 0.883 | 19 14 27.8 | 2.75 |
| 16 | 15 54 55.43 | 0.895 | 19 14 0.9 | 2.78 | 16 14 11.7 | 15 54 42.62 | 0.908 | 19 13 21.1 | 2.82 |
| 17 | 15 54 33.64 | 0.920 | 19 12 53.2 | 2.86 | 17 14 7.4 | 15 54 20.54 | 0.932 | 19 12 12.6 | 2.89 |
| 18 | 15 54 11.26 | 0.944 | 19 11 43.8 | 2.93 | 18 14 3.1 | 15 53 57.89 | 0.956 | 19 11 2.4 | 2.96 |
| 19 | 15 53 48.30 | 0.968 | 19 10 32.7 | 3.00 | 19 13 58.8 | 15 53 34.68 | 0.979 | 19 9 50.5 | 3.03 |
| 20 | 15 53 24.79 | 0.991 | 19 9 19.9 | 3.07 | 20 13 54.5 | 15 53 10.92 | 1.001 | 19 8 37.0 | 3.10 |
| 21 | 15 53 0.74 | 1.013 | 19 8 5.5 | 3.14 | 21 13 50.2 | 15 52 46.63 | 1.023 | 19 7 21.9 | 3.17 |
| 22 | 15 52 36.16 | 1.035 | 19 6 49.5 | 3.20 | 22 13 45.8 | 15 52 21.84 | 1.044 | 19 6 5.3 | 3.23 |
| 23 | 15 52 11.07 | 1.056 | 19 5 32.0 | 3.27 | 23 13 41.4 | 15 51 56.55 | 1.064 | 19 4 47.2 | 3.29 |
| 24 | 15 51 45.49 | 1.076 | 19 4 12.9 | 3.33 | 24 13 37.0 | 15 51 30.78 | 1.084 | 19 3 27.5 | 3.35 |
| 25 | 15 51 19.44 | 1.095 | 19 2 52.4 | 3.39 | 25 13 32.6 | 15 51 4.54 | 1.103 | 19 2 6.4 | 3.41 |
| 26 | 15 50 52.93 | 1.113 | 19 1 30.5 | 3.45 | 26 13 28.3 | 15 50 37.87 | 1.121 | 19 0 44.0 | 3.46 |
| 27 | 15 50 25.99 | 1.130 | 19 0 7.2 | 3.50 | 27 13 23.9 | 15 50 10.78 | 1.138 | 18 59 20.2 | 3.51 |
| 28 | 15 49 58.64 | 1.147 | 18 58 42.5 | 3.55 | 28 13 19.5 | 15 49 43.29 | 1.154 | 18 57 55.0 | 3.56 |
| 29 | 15 49 30.88 | 1.164 | 18 57 16.7 | 3.60 | 29 13 15.1 | 15 49 15.39 | 1.170 | 18 56 28.8 | 3.61 |
| 30 | 15 49 2.75 | 1.180 | 18 55 49.7 | 3.65 | 30 13 10.7 | 15 48 47.15 | 1.184 | 18 55 1.4 | 3.66 |
| 31 | 15 48 34.26 | −1.194 | −18 54 21.5 | +3.70 | 31 13 6.3 | 15 48 18.56 | −1.198 | −18 53 32.9 | +3.71 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| May 1 | 15 48 34.26 | -1.194 | -18 54 21.5 | +3.70 | 1 13 6.3 | 15 48 18.56 | -1.198 | -18 53 32.9 | +3.71 |
| 2 | 15 48 5.44 | 1.207 | 18 52 52.3 | 3.74 | 2 13 1.9 | 15 47 49.66 | 1.211 | 18 52 3.4 | 3.75 |
| 3 | 15 47 36.29 | 1.220 | 18 51 22.0 | 3.78 | 3 12 57.5 | 15 47 20.43 | 1.223 | 18 50 32.8 | 3.79 |
| 4 | 15 47 6.85 | 1.232 | 18 49 50.7 | 3.82 | 4 12 53.1 | 15 46 50.93 | 1.234 | 18 49 1.3 | 3.83 |
| 5 | 15 46 37.13 | 1.243 | 18 48 18.4 | 3.86 | 5 12 48.7 | 15 46 21.16 | 1.245 | 18 47 28.8 | 3.87 |
| 6 | 15 46 7.15 | 1.254 | 18 46 45.3 | 3.90 | 6 12 44.3 | 15 45 51.14 | 1.255 | 18 45 55.5 | 3.90 |
| 7 | 15 45 36.94 | 1.264 | 18 45 11.3 | 3.93 | 7 12 39.8 | 15 45 20.91 | 1.264 | 18 44 21.4 | 3.93 |
| 8 | 15 45 6.51 | 1.273 | 18 43 36.5 | 3.96 | 8 12 35.4 | 15 44 50.47 | 1.272 | 18 42 46.6 | 3.96 |
| 9 | 15 44 35.89 | 1.281 | 18 42 1.0 | 3.99 | 9 12 31.0 | 15 44 19.85 | 1.279 | 18 41 11.0 | 3.99 |
| 10 | 15 44 5.10 | 1.287 | 18 40 24.9 | 4.02 | 10 12 26.5 | 15 43 49.07 | 1.286 | 18 39 34.9 | 4.02 |
| 11 | 15 43 34.14 | 1.293 | 18 38 48.2 | 4.04 | 11 12 22.0 | 15 43 18.13 | 1.292 | 18 37 58.2 | 4.04 |
| 12 | 15 43 3.05 | 1.298 | 18 37 11.0 | 4.06 | 12 12 17.6 | 15 42 47.07 | 1.297 | 18 36 21.1 | 4.06 |
| 13 | 15 42 31.84 | 1.302 | 18 35 33.3 | 4.08 | 13 12 13.1 | 15 42 15.91 | 1.301 | 18 34 43.5 | 4.08 |
| 14 | 15 42 0.53 | 1.306 | 18 33 55.2 | 4.10 | 14 12 8.7 | 15 41 44.66 | 1.304 | 18 33 5.5 | 4.09 |
| 15 | 15 41 29.15 | 1.309 | 18 32 16.7 | 4.11 | 15 12 4.2 | 15 41 13.35 | 1.305 | 18 31 27.1 | 4.10 |
| 16 | 15 40 57.72 | 1.310 | 18 30 38.0 | 4.12 | 16 11 59.8 | 15 40 42.00 | 1.306 | 18 29 48.6 | 4.11 |
| 17 | 15 40 26.27 | 1.311 | 18 28 59.1 | 4.13 | 17 11 55.3 | 15 40 10.64 | 1.306 | 18 28 9.9 | 4.11 |
| 18 | 15 39 54.81 | 1.311 | 18 27 20.1 | 4.13 | 18 11 50.9 | 15 39 39.29 | 1.305 | 18 26 31.2 | 4.11 |
| 19 | 15 39 23.36 | 1.310 | 18 25 41.0 | 4.13 | 19 11 46.4 | 15 39 7.95 | 1.304 | 18 24 52.4 | 4.11 |
| 20 | 15 38 51.95 | 1.308 | 18 24 2.0 | 4.12 | 20 11 42.0 | 15 38 36.66 | 1.302 | 18 23 13.7 | 4.11 |
| 21 | 15 38 20.60 | 1.305 | 18 22 23.1 | 4.12 | 21 11 37.5 | 15 38 5.44 | 1.299 | 18 21 35.2 | 4.10 |
| 22 | 15 37 49.33 | 1.301 | 18 20 44.4 | 4.11 | 22 11 33.0 | 15 37 34.31 | 1.295 | 18 19 56.9 | 4.09 |
| 23 | 15 37 18.17 | 1.296 | 18 19 5.9 | 4.10 | 23 11 28.6 | 15 37 3.31 | 1.290 | 18 18 18.9 | 4.07 |
| 24 | 15 36 47.14 | 1.290 | 18 17 27.8 | 4.08 | 24 11 24.1 | 15 36 32.45 | 1.283 | 18 16 41.3 | 4.05 |
| 25 | 15 36 16.26 | 1.283 | 18 15 50.1 | 4.06 | 25 11 19.7 | 15 36 1.75 | 1.276 | 18 15 4.1 | 4.03 |
| 26 | 15 35 45.54 | 1.276 | 18 14 12.9 | 4.04 | 26 11 15.2 | 15 35 31.21 | 1.268 | 18 13 27.5 | 4.01 |
| 27 | 15 35 15.03 | 1 268 | 18 12 36.3 | 4.01 | 27 11 10.8 | 15 35 0.89 | 1.259 | 18 11 51.5 | 3.98 |
| 28 | 15 34 44.74 | 1.259 | 18 11 0.4 | 3.98 | 28 11 6.3 | 15 34 30.80 | 1.249 | 18 10 16.2 | 3.95 |
| 29 | 15 34 14.69 | 1.249 | 18 9 25.2 | 3.95 | 29 11 1.9 | 15 34 0.96 | 1.238 | 18 8 41.7 | 3.92 |
| 30 | 15 33 44.89 | 1.237 | 18 7 50.8 | 3.92 | 30 10 57.5 | 15 33 31.37 | 1.227 | 18 7 8.0 | 3.89 |
| 31 | 15 33 15.37 | 1.224 | 18 6 17.3 | 3.88 | 31 10 53.1 | 15 33 2.07 | 1.215 | 18 5 35.2 | 3.85 |
| June 1 | 15 32 46.14 | 1.211 | 18 4 44.8 | 3.84 | 1 10 48.7 | 15 32 33.07 | 1.202 | 18 4 3.4 | 3.81 |
| 2 | 15 32 17.23 | 1.197 | 18 3 13.4 | 3.79 | 2 10 44.3 | 15 32 4.39 | 1.188 | 18 2 32.8 | 3.76 |
| 3 | 15 31 48.64 | 1.183 | 18 1 43.0 | 3.74 | 3 10 39.9 | 15 31 36.05 | 1.173 | 18 1 3.2 | 3.71 |
| 4 | 15 31 20.42 | 1.168 | 18 0 13.6 | 3.69 | 4 10 35.5 | 15 31 8.08 | 1.158 | 17 59 34.6 | 3.66 |
| 5 | 15 30 52.57 | 1.153 | 17 58 45.6 | 3.64 | 5 10 31.1 | 15 30 40.48 | 1.142 | 17 58 7.4 | 3.61 |
| 6 | 15 30 25.09 | 1.137 | 17 57 18.9 | 3.58 | 6 10 26.7 | 15 30 13.26 | 1.126 | 17 56 41.5 | 3.55 |
| 7 | 15 29 58.00 | 1.120 | 17 55 53.5 | 3.52 | 7 10 22.3 | 15 29 46.43 | 1.109 | 17 55 17.0 | 3.49 |
| 8 | 15 29 31.35 | 1.102 | 17 54 29.6 | 3.46 | 8 10 17.9 | 15 29 20.04 | 1.091 | 17 53 54.0 | 3.43 |
| 9 | 15 29 5.13 | 1.083 | 17 53 7.1 | 3.40 | 9 10 13.5 | 15 28 54.09 | 1.072 | 17 52 32.4 | 3.37 |
| 10 | 15 28 39.35 | 1.064 | 17 51 46.2 | 3.34 | 10 10 9.2 | 15 28 28.58 | 1.053 | 17 51 12.4 | 3.30 |
| 11 | 15 28 14.04 | 1.044 | 17 50 27.0 | 3.27 | 11 10 4.9 | 15 28 3.54 | 1.033 | 17 49 54.1 | 3.23 |
| 12 | 15 27 49.21 | 1.024 | 17 49 9.4 | 3.20 | 12 10 0.6 | 15 27 38.99 | 1.013 | 17 48 37.5 | 3.16 |
| 13 | 15 27 24.87 | 1.003 | 17 47 53.5 | 3.13 | 13 9 56.2 | 15 27 14.93 | 0.992 | 17 47 22.6 | 3.08 |
| 14 | 15 27 1.04 | 0.982 | 17 46 39.4 | 3.05 | 14 9 51.9 | 15 26 51.39 | 0.970 | 17 46 9.5 | 3.00 |
| 15 | 15 26 37.72 | 0.960 | 17 45 27.3 | 2.97 | 15 9 47.6 | 15 26 28.36 | 0.948 | 17 44 58.4 | 2.92 |
| 16 | 15 26 14.94 | 0.938 | 17 44 17.0 | 2.89 | 16 9 43.3 | 15 26 5.87 | 0.925 | 17 43 49.1 | 2.84 |
| 17 | 15 25 52.71 | 0.915 | 17 43 8.7 | 2.81 | 17 9 39.0 | 15 25 43.93 | 0.902 | 17 42 41.8 | 2.76 |
| 18 | 15 25 31.05 | 0.891 | 17 42 2.4 | 2.72 | 18 9 34.7 | 15 25 22.56 | 0.878 | 17 41 36.5 | 2.67 |
| 19 | 15 25 9.96 | 0.866 | 17 40 58.3 | 2.63 | 19 9 30.4 | 15 25 1.77 | 0.854 | 17 40 33.4 | 2.58 |
| 20 | 15 24 49.46 | 0.841 | 17 39 56.3 | 2.54 | 20 9 26.1 | 15 24 41.57 | 0.829 | 17 39 32.5 | 2.49 |
| 21 | 15 24 29.57 | 0.816 | 17 38 56.5 | 2.45 | 21 9 21.8 | 15 24 21.97 | 0.804 | 17 38 33.7 | 2.40 |
| 22 | 15 24 10.29 | 0.790 | 17 37 59.1 | 2.35 | 22 9 17.6 | 15 24 2.99 | 0.778 | 17 37 37.4 | 2.30 |
| 23 | 15 23 51.64 | 0.764 | 17 37 4.0 | 2.25 | 23 9 13.4 | 15 23 44.64 | 0.752 | 17 36 43.4 | 2.20 |
| 24 | 15 23 33.62 | 0.737 | 17 36 11.2 | 2.15 | 24 9 9.2 | 15 23 26.92 | 0.725 | 17 35 51.7 | 2.10 |
| 25 | 15 23 16.24 | 0.710 | 17 35 20.8 | 2.05 | 25 9 5.0 | 15 23 9.84 | 0.698 | 17 35 2.3 | 2.00 |
| 26 | 15 22 59.52 | 0.683 | 17 34 32.8 | 1.95 | 26 9 0.8 | 15 22 53.42 | 0.671 | 17 34 15.4 | 1.90 |
| 27 | 15 22 43.46 | 0.655 | 17 33 47.4 | 1.85 | 27 8 56.6 | 15 22 37.65 | 0.643 | 17 33 31.0 | 1.80 |
| 28 | 15 22 28.07 | 0.627 | 17 33 4.4 | 1.74 | 28 8 52.4 | 15 22 22.55 | 0.615 | 17 32 49.1 | 1.70 |
| 29 | 15 22 13.36 | 0.899 | 17 32 24.0 | 1.63 | 29 8 48.2 | 15 22 8.13 | 0.587 | 17 32 9.7 | 1.59 |
| 30 | 15 21 59.34 | 0.570 | 17 31 46.2 | 1.52 | 30 8 44.0 | 15 21 54.40 | 0.558 | 17 31 33.0 | 1.48 |
| 31 | 15 21 46.02 | -0.541 | -17 31 10.9 | +1.42 | 31 8 39.8 | 15 21 41.37 | -0.529 | -17 30 58.7 | +1.37 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| July 1 | 15 21 46.02 | -0.541 | -17 31 10.9 | +1.42 | 1 8 39.8 | 15 21 41.37 | -0.529 | -17 30 58.7 | +1.37 |
| 2 | 15 21 33.38 | 0.512 | 17 30 38.2 | 1.31 | 2 8 35.7 | 15 21 29.02 | 0.500 | 17 30 27.1 | 1.26 |
| 3 | 15 21 21.44 | 0.483 | 17 30 8.2 | 1.20 | 3 8 31.6 | 15 21 17.36 | 0.471 | 17 29 58.1 | 1.15 |
| 4 | 15 21 10.20 | 0.454 | 17 29 40.8 | 1.09 | 4 8 27.5 | 15 21 6.40 | 0.442 | 17 29 31.8 | 1.04 |
| 5 | 15 20 59.66 | 0.425 | 17 29 16.1 | 0.98 | 5 8 23.4 | 15 20 56.14 | 0.413 | 17 29 8.1 | 0.93 |
| 6 | 15 20 49.84 | 0.395 | 17 28 54.1 | 0.87 | 6 8 19.3 | 15 20 46.60 | 0.383 | 17 28 47.1 | 0.82 |
| 7 | 15 20 40.73 | 0.365 | 17 28 34.8 | 0.75 | 7 8 15.2 | 15 20 37.76 | 0.353 | 17 28 28.8 | 0.71 |
| 8 | 15 20 32.34 | 0.335 | 17 28 18.2 | 0.64 | 8 8 11.1 | 15 20 29.64 | 0.323 | 17 28 13.2 | 0.60 |
| 9 | 15 20 24.67 | 0.305 | 17 28 4.3 | 0.52 | 9 8 7.0 | 15 20 22.24 | 0.293 | 17 28 0.3 | 0.49 |
| 10 | 15 20 17.72 | 0.274 | 17 27 53.2 | 0.40 | 10 8 3.0 | 15 20 15.55 | 0.263 | 17 27 50.1 | 0.37 |
| 11 | 15 20 11.50 | 0.244 | 17 27 44.9 | 0.29 | 11 7 59.0 | 15 20 9.59 | 0.233 | 17 27 42.8 | 0.26 |
| 12 | 15 20 6.01 | 0.214 | 17 27 39.3 | 0.17 | 12 7 55.0 | 15 20 4.36 | 0.203 | 17 27 38.1 | 0.14 |
| 13 | 15 20 1.25 | 0.183 | 17 27 36.5 | +0.06 | 13 7 51.0 | 15 19 59.85 | 0.173 | 17 27 36.2 | +0.03 |
| 14 | 15 19 57.22 | 0.153 | 17 27 36.5 | -0.06 | 14 7 47.0 | 15 19 56.07 | 0.143 | 17 27 37.1 | -0.09 |
| 15 | 15 19 53.93 | 0.122 | 17 27 39.3 | 0.18 | 15 7 43.0 | 15 19 53.03 | 0.112 | 17 27 40.8 | 0.20 |
| 16 | 15 19 51.37 | 0.091 | 17 27 44.9 | 0.30 | 16 7 39.0 | 15 19 50.71 | 0.081 | 17 27 47.3 | 0.32 |
| 17 | 15 19 49.55 | 0.060 | 17 27 53.3 | 0.41 | 17 7 35.0 | 15 19 49.13 | 0.050 | 17 27 56.6 | 0.44 |
| 18 | 15 19 48.47 | -0.029 | 17 28 4.5 | 0.53 | 18 7 31.1 | 15 19 48.29 | -0.020 | 17 28 8.6 | 0.56 |
| 19 | 15 19 48.14 | +0.002 | 17 28 18.5 | 0.64 | 19 7 27.2 | 15 19 48.19 | +0.011 | 17 28 23.5 | 0.68 |
| 20 | 15 19 48.55 | 0.033 | 17 28 35.4 | 0.76 | 20 7 23.3 | 15 19 48.83 | 0.042 | 17 28 41.2 | 0.80 |
| 21 | 15 19 49.70 | 0.064 | 17 28 55.1 | 0.88 | 21 7 19.4 | 15 19 50.20 | 0.073 | 17 29 1.7 | 0.91 |
| 22 | 15 19 51.60 | 0.095 | 17 29 17.6 | 1.00 | 22 7 15.5 | 15 19 52.32 | 0.104 | 17 29 25.0 | 1.03 |
| 23 | 15 19 54.24 | 0.126 | 17 29 42.9 | 1.12 | 23 7 11.6 | 15 19 55.17 | 0.135 | 17 29 51.0 | 1.15 |
| 24 | 15 19 57.62 | 0.157 | 17 30 11.0 | 1.23 | 24 7 7.7 | 15 19 58.76 | 0.165 | 17 30 19.8 | 1.26 |
| 25 | 15 20 1.73 | 0.187 | 17 30 41.8 | 1.35 | 25 7 3.8 | 15 20 3.08 | 0.195 | 17 30 51.3 | 1.37 |
| 26 | 15 20 6.58 | 0.218 | 17 31 15.4 | 1.46 | 26 7 0.0 | 15 20 8.13 | 0.226 | 17 31 25.6 | 1.48 |
| 27 | 15 20 12.16 | 0.248 | 17 31 51.7 | 1.57 | 27 6 56.2 | 15 20 13.90 | 0.256 | 17 32 2.6 | 1.59 |
| 28 | 15 20 18.47 | 0.278 | 17 32 30.7 | 1.68 | 28 6 52.4 | 15 20 20.40 | 0.286 | 17 32 42.3 | 1.70 |
| 29 | 15 20 25.51 | 0.309 | 17 33 12.3 | 1.79 | 29 6 48.6 | 15 20 27.63 | 0.316 | 17 33 24.6 | 1.81 |
| 30 | 15 20 33.28 | 0.339 | 17 33 56.7 | 1.90 | 30 6 44.8 | 15 20 35.59 | 0.346 | 17 34 9.6 | 1.92 |
| 31 | 15 20 41.77 | 0.369 | 17 34 43.7 | 2.01 | 31 6 41.0 | 15 20 44.26 | 0.376 | 17 34 57.2 | 2.03 |
| Aug. 1 | 15 20 50.97 | 0.399 | 17 35 33.3 | 2.12 | 1 6 37.2 | 15 20 53.63 | 0.406 | 17 35 47.4 | 2.14 |
| 2 | 15 21 0.89 | 0.428 | 17 36 25.5 | 2.23 | 2 6 33.4 | 15 21 3.72 | 0.435 | 17 36 40.2 | 2.25 |
| 3 | 15 21 11.51 | 0.457 | 17 37 20.3 | 2.34 | 3 6 29.6 | 15 21 14.50 | 0.464 | 17 37 35.6 | 2.36 |
| 4 | 15 21 22.83 | 0.486 | 17 38 17.6 | 2.45 | 4 6 25.9 | 15 21 25.98 | 0.493 | 17 38 33.4 | 2.47 |
| 5 | 15 21 34.85 | 0.515 | 17 39 17.4 | 2.55 | 5 6 22.2 | 15 21 38.15 | 0.522 | 17 39 33.7 | 2.57 |
| 6 | 15 21 47.56 | 0.544 | 17 40 19.9 | 2.65 | 6 6 18.5 | 15 21 51.01 | 0.550 | 17 40 36.7 | 2.67 |
| 7 | 15 22 0.96 | 0.573 | 17 41 24.7 | 2.75 | 7 6 14.8 | 15 22 4.56 | 0.579 | 17 41 41.9 | 2.77 |
| 8 | 15 22 15.06 | 0.602 | 17 42 32.0 | 2.85 | 8 6 11.1 | 15 22 18.80 | 0.608 | 17 42 49.7 | 2.87 |
| 9 | 15 22 29.85 | 0.631 | 17 43 41.7 | 2.95 | 9 6 7.4 | 15 22 33.73 | 0.636 | 17 43 59.8 | 2.97 |
| 10 | 15 22 45.33 | 0.659 | 17 44 53.7 | 3.05 | 10 6 3.7 | 15 22 49.34 | 0.664 | 17 45 12.2 | 3.07 |
| 11 | 15 23 1.48 | 0.687 | 17 46 8.1 | 3.15 | 11 6 0.0 | 15 23 5.62 | 0.692 | 17 46 27.0 | 3.17 |
| 12 | 15 23 18.30 | 0.715 | 17 47 24.8 | 3.25 | 12 5 56.4 | 15 23 22.56 | 0.720 | 17 47 44.1 | 3.27 |
| 13 | 15 23 35.79 | 0.743 | 17 48 43.9 | 3.35 | 13 5 52.8 | 15 23 40.17 | 0.748 | 17 49 3.6 | 3.36 |
| 14 | 15 23 53.94 | 0.771 | 17 50 5.2 | 3.44 | 14 5 49.2 | 15 23 58.44 | 0.776 | 17 50 25.3 | 3.45 |
| 15 | 15 24 12.76 | 0.798 | 17 51 28.8 | 3.53 | 15 5 45.6 | 15 24 17.37 | 0.803 | 17 51 49.2 | 3.54 |
| 16 | 15 24 32.24 | 0.825 | 17 52 54.6 | 3.62 | 16 5 42.0 | 15 24 36.96 | 0.830 | 17 53 15.3 | 3.63 |
| 17 | 15 24 52.37 | 0.852 | 17 54 22.6 | 3.71 | 17 5 38.4 | 15 24 57.19 | 0.857 | 17 54 43.6 | 3.72 |
| 18 | 15 25 13.15 | 0.879 | 17 55 52.7 | 3.80 | 18 5 34.8 | 15 25 18.07 | 0.884 | 17 56 14.0 | 3.81 |
| 19 | 15 25 34.58 | 0.906 | 17 57 25.0 | 3.89 | 19 5 31.2 | 15 25 39.60 | 0.911 | 17 57 46.5 | 3.90 |
| 20 | 15 25 56.65 | 0.933 | 17 58 59.3 | 3.98 | 20 5 27.6 | 15 26 1.76 | 0.937 | 17 59 21.0 | 3.99 |
| 21 | 15 26 19.35 | 0.959 | 18 0 35.7 | 4.06 | 21 5 24.0 | 15 26 24.54 | 0.963 | 18 0 57.7 | 4.07 |
| 22 | 15 26 42.68 | 0.985 | 18 2 14.1 | 4.14 | 22 5 20.5 | 15 26 47.95 | 0.989 | 18 2 36.3 | 4.15 |
| 23 | 15 27 6.64 | 1.011 | 18 3 54.5 | 4.22 | 23 5 17.0 | 15 27 11.99 | 1.015 | 18 4 16.9 | 4.23 |
| 24 | 15 27 31.21 | 1.036 | 18 5 36.8 | 4.30 | 24 5 13.5 | 15 27 36.64 | 1.040 | 18 5 59.4 | 4.31 |
| 25 | 15 27 56.40 | 1.061 | 18 7 21.0 | 4.38 | 25 5 10.0 | 15 28 1.90 | 1.065 | 18 7 43.7 | 4.39 |
| 26 | 15 28 22.19 | 1.086 | 18 9 6.9 | 4.45 | 26 5 6.5 | 15 28 27.76 | 1.090 | 18 9 29.7 | 4.46 |
| 27 | 15 28 48.58 | 1.111 | 18 10 54.7 | 4.53 | 27 5 3.0 | 15 28 54.21 | 1.114 | 18 11 17.6 | 4.53 |
| 28 | 15 29 15.56 | 1.136 | 18 12 44.3 | 4.60 | 28 4 59.5 | 15 29 21.25 | 1.138 | 18 13 7.3 | 4.60 |
| 29 | 15 29 43.13 | 1.160 | 18 14 35.6 | 4.67 | 29 4 56.0 | 15 29 48.87 | 1.162 | 18 14 58.7 | 4.67 |
| 30 | 15 30 11.27 | 1.184 | 18 16 28.5 | 4.74 | 30 4 52.5 | 15 30 17.06 | 1.186 | 18 16 51.7 | 4.74 |
| 31 | 15 30 39.98 | +1.208 | -18 18 23.1 | -4.81 | 31 4 49.1 | 15 30 45.81 | +1.210 | -18 18 46.3 | -4.81 |

# JUPITER, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | FOR MERIDIAN TRANSIT. Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
|---|---|---|---|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Sept. 1 | 15 31 9.27 | +1.232 | −18 20 19.3 | −4.88 | 1 4 45.6 | 15 31 15.14 | +1.234 | −18 20 42.5 | −4.88 |
| 2 | 15 31 39.12 | 1.255 | 18 22 17.1 | 4.94 | 2 4 42.2 | 15 31 45.03 | 1.257 | 18 22 40.4 | 4.94 |
| 3 | 15 32 9.52 | 1.278 | 18 24 16.3 | 5.00 | 3 4 38.8 | 15 32 15.47 | 1.280 | 18 24 39.6 | 5.00 |
| 4 | 15 32 40.48 | 1.301 | 18 26 17.1 | 5.06 | 4 4 35.4 | 15 32 46.46 | 1.303 | 18 26 40.4 | 5.06 |
| 5 | 15 33 11.98 | 1.324 | 18 28 19.3 | 5.12 | 5 4 32.0 | 15 33 17.99 | 1.325 | 18 28 42.6 | 5.12 |
| 6 | 15 33 44.02 | 1.347 | 18 30 22.9 | 5.18 | 6 4 28.6 | 15 33 50.06 | 1.347 | 18 30 46.1 | 5.18 |
| 7 | 15 34 16.60 | 1.369 | 18 32 27.8 | 5.24 | 7 4 25.2 | 15 34 22.66 | 1.369 | 18 32 51.0 | 5.24 |
| 8 | 15 34 49.72 | 1.391 | 18 34 34.1 | 5.29 | 8 4 21.8 | 15 34 55.80 | 1.391 | 18 34 57.2 | 5.29 |
| 9 | 15 35 23.36 | 1.413 | 18 36 41.7 | 5.34 | 9 4 18.4 | 15 35 29.45 | 1.413 | 18 37 4.8 | 5.34 |
| 10 | 15 35 57.52 | 1.435 | 18 38 50.5 | 5.39 | 10 4 15.0 | 15 36 3.62 | 1.435 | 18 39 13.5 | 5.39 |
| 11 | 15 36 32.19 | 1.456 | 18 41 0.6 | 5.44 | 11 4 11.6 | 15 36 38 30 | 1.456 | 18 41 23.5 | 5.44 |
| 12 | 15 37 7.37 | 1.477 | 18 43 11.8 | 5.49 | 12 4 8.3 | 15 37 13.49 | 1.477 | 18 43 34.6 | 5.49 |
| 13 | 15 37 43.06 | 1.498 | 18 45 24.2 | 5.54 | 13 4 5.0 | 15 37 49.18 | 1.498 | 18 45 46.9 | 5.54 |
| 14 | 15 38 19.25 | 1.519 | 18 47 37.7 | 5.59 | 14 4 1.7 | 15 38 25.37 | 1.519 | 18 48 0.3 | 5.58 |
| 15 | 15 38 55.93 | 1.539 | 18 49 52.2 | 5.63 | 15 3 58.4 | 15 39 2.05 | 1.539 | 18 50 14.6 | 5.62 |
| 16 | 15 39 33.10 | 1.559 | 18 52 7.8 | 5.67 | 16 3 55.1 | 15 39 39.22 | 1.559 | 18 52 30.0 | 5.66 |
| 17 | 15 40 10.76 | 1.579 | 18 54 24.4 | 5.71 | 17 3 51.8 | 15 40 16.87 | 1.579 | 18 54 46.5 | 5.70 |
| 18 | 15 40 48.90 | 1.599 | 18 56 41.9 | 5.75 | 18 3 48.5 | 15 40 55.00 | 1.599 | 18 57 3.8 | 5.74 |
| 19 | 15 41 27.51 | 1.619 | 18 59 0.3 | 5.79 | 19 3 45.2 | 15 41 33.59 | 1.618 | 18 59 22.0 | 5.78 |
| 20 | 15 42 6.59 | 1.638 | 19 1 19.6 | 5.83 | 20 3 41.9 | 15 42 12.65 | 1.637 | 19 1 41.1 | 5.82 |
| 21 | 15 42 46.13 | 1.657 | 19 3 39.7 | 5.86 | 21 3 38.6 | 15 42 52.17 | 1.656 | 19 4 1.0 | 5.85 |
| 22 | 15 43 26.12 | 1.676 | 19 6 0.6 | 5.89 | 22 3 35.3 | 15 43 32.14 | 1.675 | 19 6 21.7 | 5.88 |
| 23 | 15 44 6.55 | 1.694 | 19 8 22.2 | 5.92 | 23 3 32.0 | 15 44 12.54 | 1.693 | 19 8 43.1 | 5.91 |
| 24 | 15 44 47.43 | 1.712 | 19 10 44.5 | 5.95 | 24 3 28.8 | 15 44 53.39 | 1.711 | 19 11 5.2 | 5.94 |
| 25 | 15 45 28.74 | 1.730 | 19 13 7.4 | 5.97 | 25 3 25.5 | 15 45 34.67 | 1.729 | 19 13 27.9 | 5.96 |
| 26 | 15 46 10.48 | 1.748 | 19 15 30.9 | 5.99 | 26 3 22.3 | 15 46 16.38 | 1.747 | 19 15 51.2 | 5.98 |
| 27 | 15 46 52.63 | 1.765 | 19 17 55.0 | 6.01 | 27 3 19.1 | 15 46 58.49 | 1.764 | 19 18 15.0 | 6.00 |
| 28 | 15 47 35.20 | 1.782 | 19 20 19.6 | 6.03 | 28 3 15.9 | 15 47 41.02 | 1.781 | 19 20 39.3 | 6.02 |
| 29 | 15 48 18.18 | 1.799 | 19 22 44.7 | 6.05 | 29 3 12.7 | 15 48 23.96 | 1.798 | 19 23 4.2 | 6.04 |
| 30 | 15 49 1.56 | 1.816 | 19 25 10.2 | 6.07 | 30 3 9.5 | 15 49 7.30 | 1.815 | 19 25 29.4 | 6.06 |
| Oct. 1 | 15 49 45.35 | 1.833 | 19 27 36.1 | 6.09 | 1 3 6.3 | 15 49 51.05 | 1.831 | 19 27 55.0 | 6.08 |
| 2 | 15 50 29.52 | 1.849 | 19 30 2.5 | 6.11 | 2 3 3.1 | 15 50 35.17 | 1.847 | 19 30 21.1 | 6.10 |
| 3 | 15 51 14.08 | 1.865 | 19 32 29.2 | 6.12 | 3 2 59.9 | 15 51 19.68 | 1.863 | 19 32 47.6 | 6.11 |
| 4 | 15 51 59.02 | 1.881 | 19 34 56.2 | 6.13 | 4 2 56.7 | 15 52 4.57 | 1.879 | 19 35 14.3 | 6.12 |
| 5 | 15 52 44.33 | 1.896 | 19 37 23.5 | 6.14 | 5 2 53.5 | 15 52 49.82 | 1.894 | 19 37 41.3 | 6.13 |
| 6 | 15 53 30.02 | 1.911 | 19 39 51.0 | 6.15 | 6 2 50.3 | 15 53 35.45 | 1.909 | 19 40 8.5 | 6.14 |
| 7 | 15 54 16.07 | 1.926 | 19 42 18.7 | 6.15 | 7 2 47.1 | 15 54 21.44 | 1.924 | 19 42 35.9 | 6.15 |
| 8 | 15 55 2.48 | 1.941 | 19 44 46.5 | 6.16 | 8 2 43.9 | 15 55 7.79 | 1.939 | 19 45 3.4 | 6.15 |
| 9 | 15 55 49.26 | 1.956 | 19 47 14.4 | 6.16 | 9 2 40.8 | 15 55 54.51 | 1.954 | 19 47 31.0 | 6.16 |
| 10 | 15 56 36.39 | 1.971 | 19 49 42.5 | 6.17 | 10 2 37.7 | 15 56 41.57 | 1.969 | 19 49 58.7 | 6.16 |
| 11 | 15 57 23.87 | 1.985 | 19 52 10.7 | 6.17 | 11 2 34.5 | 15 57 28.99 | 1.983 | 19 52 26.6 | 6.16 |
| 12 | 15 58 11.69 | 1.999 | 19 54 38.9 | 6.17 | 12 2 31.3 | 15 58 16.74 | 1.997 | 19 54 54.5 | 6.16 |
| 13 | 15 58 59.85 | 2.013 | 19 57 7.1 | 6.17 | 13 2 28.2 | 15 59 4.83 | 2.011 | 19 57 22.4 | 6.16 |
| 14 | 15 59 48.34 | 2.027 | 19 59 35.2 | 6.17 | 14 2 25.1 | 15 59 53.25 | 2.025 | 19 59 50.2 | 6.16 |
| 15 | 16 0 37.16 | 2.041 | 20 2 3.3 | 6.16 | 15 2 22.0 | 16 0 42.00 | 2.038 | 20 2 17.9 | 6.15 |
| 16 | 16 1 26.30 | 2.054 | 20 4 31.3 | 6.16 | 16 2 18.9 | 16 1 31.06 | 2.051 | 20 4 45.6 | 6.15 |
| 17 | 16 2 15.75 | 2.067 | 20 6 59.1 | 6.15 | 17 2 15.8 | 16 2 20.43 | 2.064 | 20 7 13.1 | 6.14 |
| 18 | 16 3 5.51 | 2.080 | 20 9 26.7 | 6.14 | 18 2 12.7 | 16 3 10.11 | 2.077 | 20 9 40.3 | 6.13 |
| 19 | 16 3 55.57 | 2.092 | 20 11 54.1 | 6.13 | 19 2 9.6 | 16 4 0.09 | 2.089 | 20 12 7.4 | 6.12 |
| 20 | 16 4 45.92 | 2.104 | 20 14 21.3 | 6.12 | 20 2 6.5 | 16 4 50.36 | 2.101 | 20 14 34.3 | 6.11 |
| 21 | 16 5 36.56 | 2.116 | 20 16 48.2 | 6.11 | 21 2 3.4 | 16 5 40.92 | 2.113 | 20 17 0.8 | 6.10 |
| 22 | 16 6 27.48 | 2.128 | 20 19 14.7 | 6.10 | 22 2 0.3 | 16 6 31.75 | 2.124 | 20 19 26.9 | 6.09 |
| 23 | 16 7 18.68 | 2.139 | 20 21 40.9 | 6.09 | 23 1 57.2 | 16 7 22.86 | 2.135 | 20 21 52.8 | 6.07 |
| 24 | 16 8 10.16 | 2.150 | 20 24 6.7 | 6.07 | 24 1 54.1 | 16 8 14.25 | 2.146 | 20 24 18.2 | 6.05 |
| 25 | 16 9 1.90 | 2.161 | 20 26 32.0 | 6.05 | 25 1 51.0 | 16 9 5.90 | 2.157 | 20 26 43.1 | 6.03 |
| 26 | 16 9 53.90 | 2.172 | 20 28 56.9 | 6.03 | 26 1 48.0 | 16 9 57.81 | 2.168 | 20 29 7.7 | 6.01 |
| 27 | 16 10 46.15 | 2.182 | 20 31 21.3 | 6.01 | 27 1 44.9 | 16 10 49.97 | 2.178 | 20 31 31.7 | 5.99 |
| 28 | 16 11 38.65 | 2.192 | 20 33 45.2 | 5.99 | 28 1 41.9 | 16 11 42.38 | 2.188 | 20 33 55.3 | 5.97 |
| 29 | 16 12 31.39 | 2.202 | 20 36 8.6 | 5.97 | 29 1 38.8 | 16 12 35.02 | 2.198 | 20 36 18.4 | 5.95 |
| 30 | 16 13 24.37 | 2.212 | 20 38 31.5 | 5.94 | 30 1 35.8 | 16 13 27.90 | 2.208 | 20 38 41.0 | 5.92 |
| 31 | 16 14 17.58 | +2.222 | −20 40 53.7 | −5.91 | 31 1 32.7 | 16 14 21.01 | +2.218 | −20 41 2.8 | −5.89 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Nov. 1 | 16 15 11.02 | +2.231 | −20 43 15.2 | −5.88 | 1 1 29.7 | 16 15 14.35 | +2.227 | −20 43 23.9 | −5.87 |
| 2 | 16 16 4.68 | 2.240 | 20 45 36.1 | 5.86 | 2 1 26.6 | 16 16 7.91 | 2.236 | 20 45 44.5 | 5.85 |
| 3 | 16 16 58.56 | 2.249 | 20 47 56.4 | 5.83 | 3 1 23.6 | 16 17 1.69 | 2.245 | 20 48 4.5 | 5.82 |
| 4 | 16 17 52.65 | 2.258 | 20 50 16.0 | 5.80 | 4 1 20.5 | 16 17 55.68 | 2.254 | 20 50 23.7 | 5.79 |
| 5 | 16 18 46.95 | 2.266 | 20 52 34.9 | 5.77 | 5 1 17.5 | 16 18 49.88 | 2.262 | 20 52 42.3 | 5.76 |
| 6 | 16 19 41.44 | 2.274 | 20 54 53.0 | 5.74 | 6 1 14.4 | 16 19 44.27 | 2.270 | 20 55 0.1 | 5.73 |
| 7 | 16 20 36.13 | 2.282 | 20 57 10.3 | 5.71 | 7 1 11.4 | 16 20 38.85 | 2.278 | 20 57 17.1 | 5.70 |
| 8 | 16 21 31.02 | 2.290 | 20 59 26.8 | 5.68 | 8 1 8.4 | 16 21 33.64 | 2.286 | 20 59 33.2 | 5.67 |
| 9 | 16 22 26.09 | 2.298 | 21 1 42.5 | 5.64 | 9 1 5.4 | 16 22 28.60 | 2.294 | 21 1 48.6 | 5.63 |
| 10 | 16 23 21.34 | 2.306 | 21 3 57.4 | 5.60 | 10 1 2.4 | 16 23 23.74 | 2.301 | 21 4 3.2 | 5.59 |
| 11 | 16 24 16.77 | 2.313 | 21 6 11.4 | 5.56 | 11 0 59.4 | 16 24 19.06 | 2.308 | 21 6 16.9 | 5.55 |
| 12 | 16 25 12.37 | 2.320 | 21 8 24.5 | 5.52 | 12 0 56.4 | 16 25 14.55 | 2.315 | 21 8 29.7 | 5.51 |
| 13 | 16 26 8.13 | 2.327 | 21 10 36.7 | 5.48 | 13 0 53.4 | 16 26 10.20 | 2.322 | 21 10 41.6 | 5.47 |
| 14 | 16 27 4.05 | 2.333 | 21 12 47.9 | 5.44 | 14 0 50.4 | 16 27 6.01 | 2.328 | 21 12 52.5 | 5.43 |
| 15 | 16 28 0.12 | 2.339 | 21 14 58.1 | 5.40 | 15 0 47.4 | 16 28 1.97 | 2.334 | 21 15 2.4 | 5.39 |
| 16 | 16 28 56.34 | 2.345 | 21 17 7.3 | 5.36 | 16 0 44.4 | 16 28 58.08 | 2.340 | 21 17 11.3 | 5.35 |
| 17 | 16 29 52.70 | 2.351 | 21 19 15.5 | 5.32 | 17 0 41.4 | 16 29 54.33 | 2.346 | 21 19 19.2 | 5.31 |
| 18 | 16 30 49.19 | 2.356 | 21 21 22.7 | 5.28 | 18 0 38.4 | 16 30 50.70 | 2.351 | 21 21 26.1 | 5.27 |
| 19 | 16 31 45.80 | 2.361 | 21 23 28.8 | 5.24 | 19 0 35.4 | 16 31 47.19 | 2.356 | 21 23 31.9 | 5.23 |
| 20 | 16 32 42.53 | 2.366 | 21 25 33.8 | 5.19 | 20 0 32.4 | 16 32 43.81 | 2.361 | 21 25 36.6 | 5.18 |
| 21 | 16 33 39.37 | 2.371 | 21 27 37.7 | 5.14 | 21 0 29.4 | 16 33 40.54 | 2.366 | 21 27 40.2 | 5.13 |
| 22 | 16 34 36.32 | 2.375 | 21 29 40.5 | 5.09 | 22 0 26.4 | 16 34 37.37 | 2.370 | 21 29 42.7 | 5.08 |
| 23 | 16 35 33.38 | 2.379 | 21 31 42.1 | 5.04 | 23 0 23.5 | 16 35 34.31 | 2.374 | 21 31 44.1 | 5.03 |
| 24 | 16 36 30.53 | 2.383 | 21 33 42.6 | 4.99 | 24 0 20.5 | 16 36 31.35 | 2.378 | 21 33 44.3 | 4.98 |
| 25 | 16 37 27.77 | 2.387 | 21 35 41.9 | 4.94 | 25 0 17.5 | 16 37 28.47 | 2.382 | 21 35 43.3 | 4.93 |
| 26 | 16 38 25.09 | 2.390 | 21 37 39.9 | 4.89 | 26 0 14.5 | 16 38 25.67 | 2.385 | 21 37 41.1 | 4.88 |
| 27 | 16 39 22.49 | 2.393 | 21 39 36.7 | 4.84 | 27 0 11.5 | 16 39 22.95 | 2.388 | 21 39 37.7 | 4.83 |
| 28 | 16 40 19.96 | 2.396 | 21 41 32.3 | 4.79 | 28 0 8.5 | 16 40 20.31 | 2.391 | 21 41 33.0 | 4.78 |
| 29 | 16 41 17.50 | 2.399 | 21 43 26.7 | 4.74 | 29 0 5.6 | 16 41 17.74 | 2.394 | 21 43 27.1 | 4.73 |
| 30 | 16 42 15.09 | 2.401 | 21 45 19.8 | 4.69 | 30 0 2.7 | 16 42 15.21 | 2.396 | 21 45 20.0 | 4 68 |
| | | | | | 30 23 59.7 | 16 43 12.74 | 2.398 | 21 47 11.6 | 4.62 |
| Dec. 1 | 16 43 12.74 | 2.403 | 21 47 11.6 | 4.63 | 1 23 56.7 | 16 44 10.32 | 2.400 | 21 49 1.9 | 4.57 |
| 2 | 16 44 10.45 | 2.405 | 21 49 2.2 | 4.58 | 2 23 53.7 | 16 45 7.95 | 2.402 | 21 50 51.0 | 4.52 |
| 3 | 16 45 8.20 | 2.407 | 21 50 51.5 | 4.53 | 3 23 50.8 | 16 46 5.62 | 2.404 | 21 52 38.8 | 4.47 |
| 4 | 16 46 5.99 | 2.409 | 21 52 39.4 | 4.48 | 4 23 47.8 | 16 47 3.33 | 2.405 | 21 54 25.2 | 4.42 |
| 5 | 16 47 3.82 | 2.410 | 21 54 26.0 | 4.42 | 5 23 44.8 | 16 48 1.07 | 2.406 | 21 56 10.2 | 4.36 |
| 6 | 16 48 1.68 | 2.411 | 21 56 11.3 | 4.36 | 6 23 41.8 | 16 48 58.83 | 2.407 | 21 57 54.0 | 4.30 |
| 7 | 16 48 59.56 | 2.412 | 21 57 55.3 | 4.31 | 7 23 38.8 | 16 49 56.61 | 2.408 | 21 59 36.4 | 4.24 |
| 8 | 16 49 57.46 | 2.412 | 21 59 37.9 | 4.26 | 8 23 35.9 | 16 50 54.40 | 2.408 | 22 1 17.5 | 4.18 |
| 9 | 16 50 55.38 | 2.413 | 22 1 19.1 | 4.20 | 9 23 32.9 | 16 51 52.21 | 2.408 | 22 2 57.1 | 4.12 |
| 10 | 16 51 53.30 | 2.413 | 22 2 58.9 | 4.14 | 10 23 29.9 | 16 52 50.01 | 2.408 | 22 4 35.4 | 4.06 |
| 11 | 16 52 51.22 | 2.413 | 22 4 37.4 | 4.08 | 11 23 26.9 | 16 53 47.80 | 2.408 | 22 6 12.3 | 4.00 |
| 12 | 16 53 49.14 | 2.412 | 22 6 14.5 | 4.02 | 12 23 24.0 | 16 54 45.59 | 2.407 | 22 7 47.8 | 3.94 |
| 13 | 16 54 47.04 | 2.412 | 22 7 50.1 | 3.96 | 13 23 21.0 | 16 55 43.35 | 2.406 | 22 9 21.8 | 3.88 |
| 14 | 16 55 44.92 | 2.411 | 22 9 24.3 | 3.90 | 14 23 18.0 | 16 56 41.08 | 2.405 | 22 10 54.4 | 3.82 |
| 15 | 16 56 42.77 | 2.410 | 22 10 57.1 | 3.84 | 15 23 15.0 | 19 57 38.78 | 2.403 | 22 12 25.6 | 3.76 |
| 16 | 16 57 40.59 | 2.409 | 22 12 28.4 | 3.77 | 16 23 12.1 | 16 58 36.44 | 2.401 | 22 13 55.3 | 3.70 |
| 17 | 16 58 38.37 | 2.407 | 22 13 58.3 | 3.71 | 17 23 9.1 | 16 59 34.06 | 2.399 | 22 15 23.6 | 3.64 |
| 18 | 16 59 36.10 | 2.405 | 22 15 26.7 | 3.65 | 18 23 6.1 | 17 0 31.62 | 2.396 | 22 16 50.4 | 3.58 |
| 19 | 17 0 33.77 | 2.403 | 22 16 53.6 | 3.59 | 19 23 3.1 | 17 1 29.11 | 2.393 | 22 18 15.7 | 3.52 |
| 20 | 17 1 31.38 | 2.400 | 22 18 19.1 | 3.53 | 20 23 0.2 | 17 2 26.53 | 2.390 | 22 19 39.7 | 3.46 |
| 21 | 17 2 28.93 | 2.397 | 22 19 43.1 | 3.47 | 21 22 57.2 | 17 3 23.89 | 2.387 | 22 21 2.1 | 3.40 |
| 22 | 17 3 26.40 | 2.393 | 22 21 5.6 | 3.41 | 22 22 54.2 | 17 4 21.16 | 2.384 | 22 22 23.0 | 3.34 |
| 23 | 17 4 23.78 | 2.389 | 22 22 26.7 | 3.35 | 23 22 51.2 | 17 5 18.34 | 2.380 | 22 23 42.5 | 3.28 |
| 24 | 17 5 21.07 | 2.385 | 22 23 46.3 | 3.29 | 24 22 48.2 | 17 6 15.42 | 2.376 | 22 25 0.6 | 3 22 |
| 25 | 17 6 18.27 | 2.381 | 22 25 4.4 | 3.23 | 25 22 45.3 | 17 7 12.41 | 2.372 | 22 26 17.1 | 3.16 |
| 26 | 17 7 15.37 | 2.377 | 22 26 21.1 | 3.16 | 26 22 42.3 | 17 8 9.29 | 2.368 | 22 27 32.2 | 3.10 |
| 27 | 17 8 12.36 | 2.372 | 22 27 36.3 | 3.10 | 27 22 39.3 | 17 9 6.05 | 2.363 | 22 28 45.8 | 3.04 |
| 28 | 17 9 9.24 | 2.367 | 22 28 50.0 | 3.04 | 28 22 36.3 | 17 10 2.70 | 2.358 | 22 29 58.0 | 2.98 |
| 29 | 17 10 6.01 | 2.362 | 22 30 2.2 | 2.98 | 29 22 33.3 | 17 10 59.24 | 2.353 | 22 31 8.7 | 2.92 |
| 30 | 17 11 2.65 | 2.357 | 22 31 12.9 | 2 92 | 30 22 30.3 | 17 11 55.64 | 2.348 | 22 32 17.9 | 2.86 |
| 31 | 17 11 59.16 | 2.352 | 22 32 22.2 | 2.86 | 31 22 27.3 | 17 12 51.92 | 2.342 | 22 33 25.7 | 2.79 |
| 32 | 17 12 55.53 | +2.347 | −22 33 30.1 | −2.80 | 32 22 24.3 | 17 13 48.07 | +2.337 | −22 34 32.1 | −2.73 |

# SATURN, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Jan. 1 | 21 43 59.00 | +0.972 | -15 2 2.9 | +4.98 | 1 3 0.7 | 21 44 1.93 | +0.971 | -15 1 47.9 | +4.98 |
| 2 | 21 44 22.44 | 0.981 | 15 0 2.7 | 5.03 | 2 2 57.2 | 21 44 25.34 | 0.980 | 14 59 47.8 | 5.03 |
| 3 | 21 44 46.09 | 0.989 | 14 58 1.4 | 5 08 | 3 2 53.6 | 21 44 48.95 | 0.988 | 14 57 46.6 | 5.07 |
| 4 | 21 45 9.93 | 0.997 | 14 55 59.0 | 5.12 | 4 2 50.1 | 21 45 12.75 | 0.996 | 14 55 44.4 | 5.11 |
| 5 | 21 45 33.95 | 1.005 | 14 53 55.5 | 5.17 | 5 2 46.6 | 21 45 36.74 | 1.003 | 14 53 41.1 | 5.16 |
| 6 | 21 45 58.16 | 1.013 | 14 51 50.9 | 5.21 | 6 2 43.0 | 21 46 0.91 | 1.011 | 14 51 36.7 | 5.20 |
| 7 | 21 46 22.56 | 1.020 | 14 49 45.3 | 5.25 | 7 2 39.5 | 21 46 25.27 | 1.019 | 14 49 31.3 | 5.25 |
| 8 | 21 46 47.14 | 1.028 | 14 47 38.7 | 5.29 | 8 2 36.0 | 21 46 49.81 | 1.026 | 14 47 24.9 | 5.29 |
| 9 | 21 47 11.90 | 1.035 | 14 45 31.2 | 5.33 | 9 2 32.5 | 21 47 14.53 | 1.034 | 14 45 17.6 | 5.32 |
| 10 | 21 47 36.84 | 1.043 | 14 43 22.7 | 5.37 | 10 2 28.9 | 21 47 39.43 | 1.041 | 14 43 9.4 | 5.36 |
| 11 | 21 48 1.95 | 1.050 | 14 41 13.3 | 5.41 | 11 2 25.4 | 21 48 4.49 | 1.048 | 14 41 0.2 | 5.40 |
| 12 | 21 48 27.22 | 1.056 | 14 39 3.0 | 5.45 | 12 2 21.9 | 21 48 29.71 | 1.054 | 14 38 50.1 | 5.44 |
| 13 | 21 48 52.64 | 1.062 | 14 36 51.8 | 5.49 | 13 2 18.4 | 21 48 55.09 | 1.060 | 14 36 39.1 | 5.48 |
| 14 | 21 49 18.21 | 1.069 | 14 34 39.6 | 5.53 | 14 2 14.9 | 21 49 20.61 | 1.066 | 14 34 27.2 | 5.51 |
| 15 | 21 49 43.93 | 1.075 | 14 32 26.5 | 5.56 | 15 2 11.4 | 21 49 46.28 | 1.073 | 14 32 14.4 | 5.55 |
| 16 | 21 50 9.80 | 1.081 | 14 30 12.6 | 5.60 | 16 2 7.9 | 21 50 12.10 | 1.079 | 14 30 0.7 | 5.59 |
| 17 | 21 50 35.81 | 1.087 | 14 27 57.9 | 5.63 | 17 2 4.4 | 21 50 38.06 | 1.084 | 14 27 46.2 | 5.62 |
| 18 | 21 51 1.96 | 1.092 | 14 25 42.4 | 5.66 | 18 2 0.9 | 21 51 4.15 | 1.090 | 14 25 30.9 | 5.65 |
| 19 | 21 51 28.24 | 1.098 | 14 23 26.1 | 5.70 | 19 1 57.4 | 21 51 30.38 | 1.096 | 14 23 14.9 | 5.68 |
| 20 | 21 51 54.65 | 1.103 | 14 21 9.0 | 5.73 | 20 1 53.9 | 21 51 56.74 | 1.101 | 14 20 58.1 | 5.71 |
| 21 | 21 52 21.18 | 1.108 | 14 18 51.2 | 5.76 | 21 1 50.4 | 21 52 23.22 | 1.106 | 14 18 40.6 | 5.74 |
| 22 | 21 52 47.83 | 1.113 | 14 16 32.7 | 5.79 | 22 1 46.9 | 21 52 49.82 | 1.111 | 14 16 22.4 | 5.78 |
| 23 | 21 53 14.59 | 1.117 | 14 14 13.5 | 5.81 | 23 1 43.4 | 21 53 16.53 | 1.115 | 14 14 3.5 | 5.80 |
| 24 | 21 53 41.46 | 1.122 | 14 11 53.6 | 5.84 | 24 1 40.0 | 21 53 43.34 | 1.119 | 14 11 43.9 | 5.83 |
| 25 | 21 54 8.44 | 1.127 | 14 9 33.0 | 5.87 | 25 1 36.5 | 21 54 10.26 | 1.124 | 14 9 23.6 | 5.86 |
| 26 | 21 54 35.53 | 1.131 | 14 7 11.7 | 5.90 | 26 1 33.0 | 21 54 37.28 | 1.128 | 14 7 2.6 | 5.89 |
| 27 | 21 55 2.71 | 1.134 | 14 4 49.8 | 5.92 | 27 1 29.5 | 21 55 4.40 | 1.132 | 14 4 41.0 | 5.91 |
| 28 | 21 55 29.97 | 1.138 | 14 2 27.4 | 5.94 | 28 1 26.0 | 21 55 31.60 | 1.135 | 14 2 18.9 | 5.93 |
| 29 | 21 55 57.31 | 1.141 | 14 0 4.5 | 5.96 | 29 1 22.6 | 21 55 58.88 | 1.138 | 13 59 56.3 | 5.95 |
| 30 | 21 56 24.73 | 1.144 | 13 57 41.1 | 5.99 | 30 1 19.1 | 21 56 26.24 | 1.141 | 13 57 33.2 | 5.97 |
| 31 | 21 56 52.22 | 1.147 | 13 55 17.1 | 6.01 | 31 1 15.6 | 21 56 53.67 | 1.144 | 13 55 9.6 | 5.99 |
| Feb. 1 | 21 57 19.78 | 1.150 | 13 52 52.6 | 6.03 | 1 1 12.1 | 21 57 21.17 | 1.147 | 13 52 45.5 | 6.01 |
| 2 | 21 57 47.41 | 1.153 | 13 50 27.7 | 6.05 | 2 1 8.6 | 21 57 48.74 | 1.150 | 13 50 20.9 | 6.03 |
| 3 | 21 58 15.10 | 1.155 | 13 48 2.4 | 6.06 | 3 1 5.2 | 21 58 16.37 | 1.152 | 13 47 55.9 | 6.05 |
| 4 | 21 58 42.85 | 1.158 | 13 45 36.8 | 6 07 | 4 1 1.7 | 21 58 44.05 | 1.155 | 13 45 30.6 | 6.06 |
| 5 | 21 59 10.66 | 1.160 | 13 43 10.8 | 6.09 | 5 0 58.2 | 21 59 11.79 | 1.157 | 13 43 4.9 | 6.08 |
| 6 | 21 59 38.52 | 1.161 | 13 40 44.5 | 6.10 | 6 0 54.8 | 21 59 39.57 | 1.158 | 13 40 38.9 | 6.09 |
| 7 | 22 0 6.41 | 1.162 | 13 38 17.8 | 6.12 | 7 0 51.3 | 22 0 7.39 | 1.160 | 13 38 12.6 | 6.10 |
| 8 | 22 0 34.33 | 1.164 | 13 35 50.7 | 6.14 | 8 0 47.8 | 22 0 35.25 | 1.161 | 13 35 45.9 | 6.12 |
| 9 | 22 1 2.28 | 1.165 | 13 33 23.3 | 6.15 | 9 0 44.3 | 22 1 3.14 | 1.163 | 13 33 18.8 | 6.14 |
| 10 | 22 1 30.26 | 1.166 | 13 30 55.6 | 6.16 | 10 0 40.9 | 22 1 31.05 | 1.164 | 13 30 51.4 | 6.15 |
| 11 | 22 1 58.27 | 1.167 | 13 28 27.7 | 6.17 | 11 0 37.4 | 22 1 58.99 | 1.165 | 13 28 23.8 | 6.15 |
| 12 | 22 2 26.30 | 1.168 | 13 25 59.6 | 6.17 | 12 0 33.9 | 22 2 26.95 | 1.166 | 13 25 56.0 | 6.16 |
| 13 | 22 2 54.35 | 1.169 | 13 23 31.3 | 6.18 | 13 0 30.5 | 22 2 54.94 | 1.167 | 13 23 28.1 | 6.16 |
| 14 | 22 3 22.42 | 1.170 | 13 21 2.9 | 6.19 | 14 0 27.0 | 22 3 22.95 | 1.167 | 13 21 0.1 | 6.17 |
| 15 | 22 3 50.51 | 1.170 | 13 18 34.3 | 6.19 | 15 0 23.5 | 22 3 50.97 | 1.167 | 13 18 31.9 | 6.18 |
| 16 | 22 4 18.60 | 1.170 | 13 16 5.6 | 6.20 | 16 0 20.1 | 22 4 18.99 | 1.167 | 13 16 3.6 | 6.18 |
| 17 | 22 4 46.68 | 1.170 | 13 13 36.8 | 6.20 | 17 0 16.6 | 22 4 47.01 | 1.167 | 13 13 35.2 | 6.19 |
| 18 | 22 5 14.76 | 1.170 | 13 11 7.9 | 6.21 | 18 0 13.1 | 22 5 15.02 | 1.167 | 13 11 6.6 | 6.19 |
| 19 | 22 5 42.83 | 1.169 | 13 8 38.9 | 6.21 | 19 0 9.7 | 22 5 43.02 | 1.166 | 13 8 37.9 | 6.20 |
| 20 | 22 6 10.88 | 1.168 | 13 6 9.7 | 6.22 | 20 0 6.2 | 22 6 11.00 | 1.166 | 13 6 9.1 | 6.20 |
| 21 | 22 6 38.91 | 1.167 | 13 3 40.5 | 6.21 | 21 0 2.7 | 22 6 38.97 | 1.165 | 13 3 40.3 | 6.20 |
| | | | | | 21 23 59.3 | 22 7 6.92 | 1.164 | 13 1 11.6 | 6.19 |
| 22 | 22 7 6.92 | 1.167 | 13 1 11.4 | 6.21 | 22 23 55.8 | 22 7 34.84 | 1.163 | 12 58 43.0 | 6.19 |
| 23 | 22 7 34.91 | 1.166 | 12 58 42.4 | 6.20 | 23 23 52.4 | 22 8 2.74 | 1.162 | 12 56 14.5 | 6.19 |
| 24 | 22 8 2.88 | 1.165 | 12 56 13.6 | 6.20 | 24 23 48.9 | 22 8 30.61 | 1.160 | 12 53 46.1 | 6.18 |
| 25 | 22 8 30.82 | 1.163 | 12 53 44.9 | 6.19 | 25 23 45.4 | 22 8 58.43 | 1.158 | 12 51 17.8 | 6.17 |
| 26 | 22 8 58.71 | 1.161 | 12 51 16.3 | 6.19 | 26 23 42.0 | 22 9 26.20 | 1.156 | 12 48 49.7 | 6.17 |
| 27 | 22 9 26.55 | 1.159 | 12 48 47.9 | 6.18 | 27 23 38.5 | 22 9 53.92 | 1.154 | 12 46 21.7 | 6.16 |
| 28 | 22 9 54.34 | 1.157 | 12 46 19.6 | 6.18 | 28 23 35.0 | 22 10 21.59 | 1.152 | 12 43 53.9 | 6.15 |
| 29 | 22 10 22.08 | 1.155 | 12 43 51.4 | 6.17 | 29 23 31.5 | 22 10 49.21 | 1.150 | 12 41 26.3 | 6.14 |
| 30 | 22 10 49.76 | +1.152 | -12 41 23.4 | +6.16 | 30 23 28.1 | 22 11 16.77 | +1.147 | -12 38 59.0 | +6.13 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Mar. 1 | 22 10 49.76 | +1.152 | -12 41 23.4 | +6.16 | 1 23 28.1 | 22 11 16.77 | +1.147 | -12 38 59.0 | +6.13 |
| 2 | 22 11 17.38 | 1.149 | 12 38 55.7 | 6.15 | 2 23 24.6 | 22 11 44.26 | 1.144 | 12 36 32.0 | 6.12 |
| 3 | 22 11 44.93 | 1.146 | 12 36 28.4 | 6.13 | 3 23 21.1 | 22 12 11.67 | 1.141 | 12 34 5.3 | 6.10 |
| 4 | 22 12 12.41 | 1.143 | 12 34 1.4 | 6.12 | 4 23 17.6 | 22 12 39.01 | 1.138 | 12 31 39.0 | 6.09 |
| 5 | 22 12 39.81 | 1.140 | 12 31 34.8 | 6.10 | 5 23 14.1 | 22 13 6.27 | 1.134 | 12 29 13.1 | 6.07 |
| 6 | 22 13 7.14 | 1.137 | 12 29 8.5 | 6.09 | 6 23 10.7 | 22 13 33.45 | 1.131 | 12 26 47.6 | 6.05 |
| 7 | 22 13 34.38 | 1.133 | 12 26 42.6 | 6.07 | 7 23 7.2 | 22 14 0.54 | 1.127 | 12 24 22.5 | 6.04 |
| 8 | 22 14 1.53 | 1.129 | 12 24 17.1 | 6.05 | 8 23 3.7 | 22 14 27.54 | 1.123 | 12 21 57.7 | 6.02 |
| 9 | 22 14 28.59 | 1.126 | 12 21 52.0 | 6.03 | 9 23 0.2 | 22 14 54.45 | 1.119 | 12 19 33.4 | 6.00 |
| 10 | 22 14 55.56 | 1.122 | 12 19 27.4 | 6.01 | 10 22 56.7 | 22 15 21.26 | 1.115 | 12 17 9.6 | 5.98 |
| 11 | 22 15 22.44 | 1.118 | 12 17 3.3 | 5.99 | 11 22 53.2 | 22 15 47.97 | 1.111 | 12 14 46.3 | 5.96 |
| 12 | 22 15 49.21 | 1.113 | 12 14 39.7 | 5.97 | 12 22 49.7 | 22 16 14.58 | 1.106 | 12 12 23.5 | 5.94 |
| 13 | 22 16 15.88 | 1.109 | 12 12 16.6 | 5.95 | 13 22 46.3 | 22 16 41.08 | 1.102 | 12 10 1.3 | 5.91 |
| 14 | 22 16 42.44 | 1.104 | 12 9 54.1 | 5.93 | 14 22 42.8 | 22 17 7.46 | 1.097 | 12 7 39.7 | 5.89 |
| 15 | 22 17 8.88 | 1.099 | 12 7 32.1 | 5.90 | 15 22 39.3 | 22 17 33.72 | 1.092 | 12 5 18.6 | 5.87 |
| 16 | 22 17 35.20 | 1.094 | 12 5 10.7 | 5.88 | 16 22 35.8 | 22 17 59.87 | 1.087 | 12 2 58.1 | 5.84 |
| 17 | 22 18 1.40 | 1.089 | 12 2 49.9 | 5.85 | 17 22 32.3 | 22 18 25.90 | 1.082 | 12 0 38.3 | 5.81 |
| 18 | 22 18 27.48 | 1.084 | 12 0 29.8 | 5.82 | 18 22 28.8 | 22 18 51.80 | 1.076 | 11 58 19.2 | 5.78 |
| 19 | 22 18 53.43 | 1.079 | 11 58 10.4 | 5.79 | 19 22 25.3 | 22 19 17.57 | 1.071 | 11 56 0.8 | 5.75 |
| 20 | 22 19 19.25 | 1.073 | 11 55 51.7 | 5.76 | 20 22 21.8 | 22 19 43.20 | 1.065 | 11 53 43.1 | 5.72 |
| 21 | 22 19 44.94 | 1.067 | 11 53 33.7 | 5.73 | 21 22 18.3 | 22 20 8.69 | 1.059 | 11 51 26.2 | 5.69 |
| 22 | 22 20 10.49 | 1.061 | 11 51 16.5 | 5.70 | 22 22 14.8 | 22 20 34.04 | 1.053 | 11 49 10.0 | 5.66 |
| 23 | 22 20 35.89 | 1.055 | 11 49 0.1 | 5.67 | 23 22 11.2 | 22 20 59.23 | 1.046 | 11 46 54.6 | 5.62 |
| 24 | 22 21 1.13 | 1.048 | 11 46 44.5 | 5.63 | 24 22 7.7 | 22 21 24.26 | 1.040 | 11 44 40.1 | 5.59 |
| 25 | 22 21 26.21 | 1.042 | 11 44 29.7 | 5.60 | 25 22 4.2 | 22 21 49.14 | 1.033 | 11 42 26.5 | 5.55 |
| 26 | 22 21 51.14 | 1.035 | 11 42 15.8 | 5.56 | 26 22 0.7 | 22 22 13.86 | 1.027 | 11 40 13.8 | 5.51 |
| 27 | 22 22 15.91 | 1.029 | 11 40 2.8 | 5.52 | 27 21 57.2 | 22 22 38.42 | 1.020 | 11 38 2.0 | 5 47 |
| 28 | 22 22 40.51 | 1.022 | 11 37 50.8 | 5.48 | 28 21 53.6 | 22 23 2.81 | 1.013 | 11 35 51.2 | 5.43 |
| 29 | 22 23 4.94 | 1.014 | 11 35 39.7 | 5.44 | 29 21 50.1 | 22 23 27.02 | 1.005 | 11 33 41.3 | 5.39 |
| 30 | 22 23 29.19 | 1.007 | 11 33 29.6 | 5.40 | 30 21 46.6 | 22 23 51.04 | 0.997 | 11 31 32.4 | 5.35 |
| 31 | 22 23 53.26 | 0.999 | 11 31 20.5 | 5.36 | 31 21 43.0 | 22 24 14.88 | 0.990 | 11 29 24.5 | 5.31 |
| Apr. 1 | 22 24 17.14 | 0.991 | 11 29 12.4 | 5.31 | 1 21 39.5 | 22 24 38.54 | 0.982 | 11 27 17.7 | 5.26 |
| 2 | 22 24 40.84 | 0.984 | 11 27 5.4 | 5.27 | 2 21 35.9 | 22 25 2.02 | 0.975 | 11 25 11.9 | 5.22 |
| 3 | 22 25 4.36 | 0.976 | 11 24 59.4 | 5.23 | 3 21 32.4 | 22 25 25.32 | 0.967 | 11 23 7.2 | 5.17 |
| 4 | 22 25 27.69 | 0.968 | 11 22 54.5 | 5.18 | 4 21 28.9 | 22 25 48.42 | 0.958 | 11 21 3.6 | 5 13 |
| 5 | 22 25 50.83 | 0.960 | 11 20 50.7 | 5.14 | 5 21 25.3 | 22 26 11.32 | 0 950 | 11 19 1.1 | 5.08 |
| 6 | 22 26 13.77 | 0.952 | 11 18 48.0 | 5.09 | 6 21 21.8 | 22 26 34.01 | 0.941 | 11 16 59.8 | 5.03 |
| 7 | 22 26 36.50 | 0.943 | 11 16 46.5 | 5.04 | 7 21 18.2 | 22 26 56.49 | 0.932 | 11 14 59.7 | 4.98 |
| 8 | 22 26 59.01 | 0.934 | 11 14 46.2 | 4.99 | 8 21 14.6 | 22 27 18.76 | 0.924 | 11 13 0.9 | 4.92 |
| 9 | 22 27 21.31 | 0.925 | 11 12 47.2 | 4.93 | 9 21 11.1 | 22 27 40.82 | 0.915 | 11 11 3.3 | 4.87 |
| 10 | 22 27 43.40 | 0.916 | 11 10 49.5 | 4.88 | 10 21 7.5 | 22 28 2.66 | 0.906 | 11 9 6.9 | 4.82 |
| 11 | 22 28 5.27 | 0.907 | 11 8 53.0 | 4.83 | 11 21 3.9 | 22 28 24.29 | 0.897 | 11 7 11.8 | 4.77 |
| 12 | 22 28 26.93 | 0.898 | 11 6 57.8 | 4.77 | 12 21 0.3 | 22 28 45.70 | 0.888 | 11 5 18.0 | 4.72 |
| 13 | 22 28 48.37 | 0.889 | 11 5 3.8 | 4.72 | 13 20 56.8 | 22 29 6.89 | 0.878 | 11 3 25.4 | 4.66 |
| 14 | 22 29 9.58 | 0.879 | 11 3 11.1 | 4.67 | 14 20 53.2 | 22 29 27.85 | 0.869 | 11 1 34.1 | 4.61 |
| 15 | 22 29 30.56 | 0.869 | 11 1 19.7 | 4.61 | 15 20 49.6 | 22 29 48.58 | 0.859 | 10 59 44.2 | 4.55 |
| 16 | 22 29 51.31 | 0.860 | 10 59 29.7 | 4.55 | 16 20 46.0 | 22 30 9.07 | 0.849 | 10 57 55.7 | 4.49 |
| 17 | 22 30 11.82 | 0.850 | 10 57 41.2 | 4.49 | 17 20 42.4 | 22 30 29.32 | 0.839 | 10 56 8.6 | 4.43 |
| 18 | 22 30 32.09 | 0.839 | 10 55 54.1 | 4.43 | 18 20 38.8 | 22 30 49.32 | 0.828 | 10 54 23.0 | 4.37 |
| 19 | 22 30 52.11 | 0.829 | 10 54 8.4 | 4.37 | 19 20 35.2 | 22 31 9.08 | 0.818 | 10 52 38.9 | 4.31 |
| 20 | 22 31 11.88 | 0.819 | 10 52 24.2 | 4.31 | 20 20 31.6 | 22 31 28.59 | 0.807 | 10 50 56.3 | 4.24 |
| 21 | 22 31 31.40 | 0.808 | 10 50 41.5 | 4.25 | 21 20 28.0 | 22 31 47.84 | 0.797 | 10 49 15.2 | 4.18 |
| 22 | 22 31 50.66 | 0.797 | 10 49 0.4 | 4.18 | 22 20 24.4 | 22 32 6.83 | 0.786 | 10 47 35.6 | 4.12 |
| 23 | 22 32 9.65 | 0.786 | 10 47 20.8 | 4.12 | 23 20 20.7 | 22 32 25.55 | 0.774 | 10 45 57.5 | 4.05 |
| 24 | 22 32 28.38 | 0.775 | 10 45 42.7 | 4.05 | 24 20 17.1 | 22 32 44.00 | 0.763 | 10 44 21.0 | 3.99 |
| 25 | 22 32 46.84 | 0.764 | 10 44 6.2 | 3.99 | 25 20 13.5 | 22 33 2.18 | 0.752 | 10 42 46.1 | 3.92 |
| 26 | 22 33 5.03 | 0.752 | 10 42 31.3 | 3.92 | 26 20 9.9 | 22 33 20.09 | 0.741 | 10 41 12.9 | 3.85 |
| 27 | 22 33 22.94 | 0.741 | 10 40 58.1 | 3.85 | 27 20 6.2 | 22 33 37.73 | 0.729 | 10 39 41.4 | 3.78 |
| 28 | 22 33 40.58 | 0.729 | 10 39 26.6 | 3.78 | 28 20 2.6 | 22 33 55.09 | 0.717 | 10 38 11.6 | 3.71 |
| 29 | 22 33 57.94 | 0.717 | 10 37 56.8 | 3.70 | 29 19 58.9 | 22 34 12.17 | 0.706 | 10 36 43.5 | 3.64 |
| 30 | 22 34 15.02 | 0.706 | 10 36 28.8 | 3.63 | 30 19 55.3 | 22 34 28.97 | 0.694 | 10 35 17.1 | 3.56 |
| 31 | 22 34 31.81 | +0.694 | -10 35 2.5 | +3.56 | 31 19 51.6 | 22 34 45.48 | +0.682 | -10 33 52.4 | +3.49 |

# SATURN, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| May 1 | 22 34 31.81 | +0.694 | -10 35 2.5 | +3.56 | 1 19 51.6 | 22 34 45.48 | +0.682 | -10 33 52.4 | +3.49 |
| 2 | 22 34 48.31 | 0.681 | 10 33 37.9 | 3.49 | 2 19 48.0 | 22 35 1.69 | 0 669 | 10 32 29.4 | 3.42 |
| 3 | 22 35 4.51 | 0.669 | 10 32 15.0 | 3.42 | 3 19 44.3 | 22 35 17.61 | 0.657 | 10 31 8.1 | 3.35 |
| 4 | 22 35 20.42 | 0.657 | 10 30 53.8 | 3.35 | 4 19 40.6 | 22 35 33.23 | 0.645 | 10 29 48.5 | 3.28 |
| 5 | 22 35 36.03 | 0.644 | 10 29 34.4 | 3.27 | 5 19 37.0 | 22 35 48.56 | 0.632 | 10 28 30.8 | 3.20 |
| 6 | 22 35 51.34 | 0.632 | 10 28 16.8 | 3.19 | 6 19 33.3 | 22 36 3.59 | 0.620 | 10 27 15.0 | 3.12 |
| 7 | 22 36 6.35 | 0.619 | 10 27 1.1 | 3.11 | 7 19 29.6 | 22 36 18.31 | 0.607 | 10 26 1.0 | 3.04 |
| 8 | 22 36 21.06 | 0.606 | 10 25 47.3 | 3.04 | 8 19 25.9 | 22 36 32.73 | 0.595 | 10 24 48.9 | 2.96 |
| 9 | 22 36 35.46 | 0.594 | 10 24 35.4 | 2.96 | 9 19 22.2 | 22 36 46.85 | 0.582 | 10 23 38.7 | 2.89 |
| 10 | 22 36 49.55 | 0.581 | 10 23 25.3 | 2.88 | 10 19 18.5 | 22 37 0.66 | 0.569 | 10 22 30.3 | 2.81 |
| 11 | 22 37 3.33 | 0.567 | 10 22 17.1 | 2.80 | 11 19 14.8 | 22 37 14.15 | 0.555 | 10 21 23.8 | 2.73 |
| 12 | 22 37 16.79 | 0.554 | 10 21 10.8 | 2.72 | 12 19 11.1 | 22 37 27.32 | 0.542 | 10 20 19.2 | 2.65 |
| 13 | 22 37 29.93 | 0.541 | 10 20 6.4 | 2.64 | 13 19 7.4 | 22 37 40.16 | 0.528 | 10 19 16.6 | 2.57 |
| 14 | 22 37 42.74 | 0.527 | 10 19 4.0 | 2.56 | 14 19 3.6 | 22 37 52.68 | 0.515 | 10 18 15.9 | 2.49 |
| 15 | 22 37 55.23 | 0.514 | 10 18 3.6 | 2.47 | 15 18 59.9 | 22 38 4.88 | 0.501 | 10 17 17.2 | 2.40 |
| 16 | 22 38 7.39 | 0.500 | 10 17 5.2 | 2.39 | 16 18 56.2 | 22 38 16.75 | 0.488 | 10 16 20.5 | 2.32 |
| 17 | 22 38 19.22 | 0.486 | 10 16 8.8 | 2.31 | 17 18 52.4 | 22 38 28.29 | 0.474 | 10 15 25.8 | 2.24 |
| 18 | 22 38 30.72 | 0.472 | 10 15 14.4 | 2.23 | 18 18 48.7 | 22 38 39.50 | 0.460 | 10 14 33.0 | 2.15 |
| 19 | 22 38 41.88 | 0.458 | 10 14 21.9 | 2.14 | 19 18 44.9 | 22 38 50.37 | 0.446 | 10 13 42.3 | 2.07 |
| 20 | 22 38 52.71 | 0.444 | 10 13 31.5 | 2.06 | 20 18 41.2 | 22 39 0.91 | 0.432 | 10 12 53.7 | 1.98 |
| 21 | 22 39 3.20 | 0.430 | 10 12 43.2 | 1.97 | 21 18 37.4 | 22 39 11.10 | 0.417 | 10 12 7.2 | 1.89 |
| 22 | 22 39 13.34 | 0.415 | 10 11 57.0 | 1.88 | 22 18 33.6 | 22 39 20.94 | 0.403 | 10 11 22.8 | 1.81 |
| 23 | 22 39 23.13 | 0.401 | 10 11 13.0 | 1.79 | 23 18 29.9 | 22 39 30.44 | 0.388 | 10 10 40.5 | 1.72 |
| 24 | 22 39 32.57 | 0.386 | 10 10 31.1 | 1.70 | 24 18 26.1 | 22 39 39.58 | 0.374 | 10 10 0.4 | 1.63 |
| 25 | 22 39 41.65 | 0.371 | 10 9 51.4 | 1.61 | 25 18 22.3 | 22 39 48.37 | 0.359 | 10 9 22.4 | 1.54 |
| 26 | 22 39 50.38 | 0.356 | 10 9 13.8 | 1.52 | 26 18 18.5 | 22 39 56.81 | 0.344 | 10 8 46.5 | 1.45 |
| 27 | 22 39 58.76 | 0.342 | 10 8 38.3 | 1.43 | 27 18 14.7 | 22 40 4.90 | 0.330 | 10 8 12.7 | 1.36 |
| 28 | 22 40 6.78 | 0.327 | 10 8 5.0 | 1.34 | 28 18 10.9 | 22 40 12.64 | 0.315 | 10 7 41.1 | 1.27 |
| 29 | 22 40 14.45 | 0.312 | 10 7 33.8 | 1.25 | 29 18 7.1 | 22 40 20.02 | 0.300 | 10 7 11.7 | 1.18 |
| 30 | 22 40 21.77 | 0.297 | 10 7 4.8 | 1.16 | 30 18 3.3 | 22 40 27.04 | 0.285 | 10 6 44.4 | 1.09 |
| 31 | 22 40 28.73 | 0.282 | 10 6 38.0 | 1.07 | 31 17 59.5 | 22 40 33.70 | 0.270 | 10 6 19.3 | 1.00 |
| June 1 | 22 40 35.32 | 0.267 | 10 6 13.4 | 0.98 | 1 17 55.6 | 22 40 40.00 | 0.255 | 10 5 56.4 | 0.91 |
| 2 | 22 40 41.55 | 0.252 | 10 5 51.0 | 0.89 | 2 17 51.8 | 22 40 45.94 | 0.240 | 10 5 35.6 | 0.82 |
| 3 | 22 40 47.41 | 0.236 | 10 5 30.7 | 0.80 | 3 17 48.0 | 22 40 51.51 | 0.225 | 10 5 17.0 | 0.73 |
| 4 | 22 40 52.90 | 0.221 | 10 5 12.6 | 0.71 | 4 17 44.1 | 22 40 56.72 | 0.210 | 10 5 0.6 | 0.64 |
| 5 | 22 40 58.03 | 0.206 | 10 4 56.7 | 0.62 | 5 17 40.3 | 22 41 1.58 | 0.195 | 10 4 46.4 | 0.55 |
| 6 | 22 41 2.80 | 0.191 | 10 4 43.0 | 0.52 | 6 17 36.4 | 22 41 6.08 | 0.180 | 10 4 34.4 | 0.45 |
| 7 | 22 41 7.21 | 0.176 | 10 4 31.6 | 0.43 | 7 17 32.5 | 22 41 10.21 | 0.164 | 10 4 24.6 | 0.36 |
| 8 | 22 41 11.25 | 0.161 | 10 4 22.4 | 0.34 | 8 17 28.7 | 22 41 13.97 | 0.149 | 10 4 17.0 | 0.27 |
| 9 | 22 41 14.93 | 0.146 | 10 4 15.4 | 0.25 | 9 17 24.8 | 22 41 17.37 | 0.134 | 10 4 11.7 | 0.18 |
| 10 | 22 41 18.24 | 0.130 | 10 4 10.6 | 0.15 | 10 17 20.9 | 22 41 20.40 | 0.119 | 10 4 8.5 | +0.09 |
| 11 | 22 41 21.17 | 0.114 | 10 4 8.0 | +0.06 | 11 17 17.0 | 22 41 23.06 | 0.103 | 10 4 7.5 | 0.00 |
| 12 | 22 41 23.73 | 0.099 | 10 4 7.7 | -0.03 | 12 17 13.1 | 22 41 25.34 | 0.087 | 10 4 8.7 | -0.10 |
| 13 | 22 41 25.91 | 0.083 | 10 4 9.6 | 0.12 | 13 17 9.2 | 22 41 27.24 | 0.071 | 10 4 12.2 | 0.19 |
| 14 | 22 41 27.71 | 0.067 | 10 4 13.7 | 0.22 | 14 17 5.3 | 22 41 28.77 | 0.056 | 10 4 17.9 | 0.28 |
| 15 | 22 41 29.14 | 0.052 | 10 4 20.0 | 0.31 | 15 17 1.4 | 22 41 29.94 | 0.041 | 10 4 25.8 | 0.38 |
| 16 | 22 41 30.20 | 0.036 | 10 4 28.6 | 0.40 | 16 16 57.5 | 22 41 30.74 | 0.025 | 10 4 35.9 | 0.47 |
| 17 | 22 41 30.89 | 0.021 | 10 4 39.4 | 0.50 | 17 16 53.6 | 22 41 31.16 | +0.010 | 10 4 48.3 | 0.56 |
| 18 | 22 41 31.20 | +0.005 | 10 4 52.4 | 0.59 | 18 16 49.6 | 22 41 31.21 | -0.006 | 10 5 2.9 | 0.65 |
| 19 | 22 41 31.14 | -0.010 | 10 5 7.7 | 0.68 | 19 16 45.7 | 22 41 30.88 | 0.021 | 10 5 19.7 | 0.75 |
| 20 | 22 41 30.71 | 0.026 | 10 5 25.2 | 0.78 | 20 16 41.8 | 22 41 30.18 | 0.037 | 10 5 38.7 | 0.84 |
| 21 | 22 41 29.90 | 0.042 | 10 5 44.9 | 0.87 | 21 16 37.8 | 22 41 29.11 | 0.052 | 10 5 59.9 | 0.93 |
| 22 | 22 41 28.71 | 0.057 | 10 6 6.8 | 0.96 | 22 16 33.8 | 22 41 27.67 | 0.068 | 10 6 23.3 | 1.02 |
| 23 | 22 41 27.15 | 0.073 | 10 6 30.9 | 1.05 | 23 16 29.9 | 22 41 25.86 | 0.083 | 10 6 48.8 | 1.11 |
| 24 | 22 41 25.22 | 0.088 | 10 6 57.2 | 1.14 | 24 16 25.9 | 22 41 23.68 | 0.099 | 10 7 16.5 | 1.20 |
| 25 | 22 41 22.92 | 0.104 | 10 7 25.7 | 1.23 | 25 16 21.9 | 22 41 21.13 | 0.114 | 10 7 46.4 | 1.29 |
| 26 | 22 41 20.25 | 0.119 | 10 7 56.3 | 1.32 | 26 16 17.9 | 22 41 18.21 | 0.129 | 10 8 18.4 | 1.38 |
| 27 | 22 41 17.21 | 0.134 | 10 8 29.1 | 1.41 | 27 16 14.0 | 22 41 14.94 | 0.144 | 10 8 52.5 | 1.47 |
| 28 | 22 41 13.81 | 0.149 | 10 9 4.0 | 1.50 | 28 16 10.0 | 22 41 11.31 | 0.159 | 10 9 28.8 | 1.56 |
| 29 | 22 41 10.05 | 0.164 | 10 9 41.1 | 1.59 | 29 16 6.0 | 22 41 7.32 | 0.174 | 10 10 7.2 | 1.64 |
| 30 | 22 41 5.93 | 0.179 | 10 10 20.3 | 1.68 | 30 16 2.0 | 22 41 2.97 | 0.189 | 10 10 47.6 | 1.73 |
| 31 | 22 41 1.45 | -0.194 | -10 11 1.5 | -1.76 | 31 15 58.0 | 22 40 58.26 | -0.204 | -10 11 30.0 | -1.81 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| July 1 | 22 41 1.45 | -0.194 | -10 11 1.5 | -1.76 | 1 15 58.0 | 22 40 58.26 | -0.204 | -10 11 30.0 | -1.81 |
| 2 | 22 40 56.61 | 0.209 | 10 11 44.7 | 1.84 | 2 15 54.0 | 22 40 53.19 | 0.219 | 10 12 14.4 | 1.89 |
| 3 | 22 40 51.41 | 0.224 | 10 12 29.9 | 1.93 | 3 15 49.9 | 22 40 47.77 | 0.233 | 10 13 0.9 | 1.98 |
| 4 | 22 40 45.85 | 0.239 | 10 13 17.2 | 2.01 | 4 15 45.9 | 22 40 42.00 | 0.247 | 10 13 49.4 | 2.06 |
| 5 | 22 40 39.94 | 0.253 | 10 14 6.5 | 2.09 | 5 15 41.9 | 22 40 35.89 | 0.262 | 10 14 39.8 | 2.14 |
| 6 | 22 40 33.69 | 0.267 | 10 14 57.7 | 2.18 | 6 15 37.8 | 22 40 29.44 | 0.276 | 10 15 32.1 | 2.22 |
| 7 | 22 40 27.10 | 0.282 | 10 15 50.9 | 2.26 | 7 15 33.8 | 22 40 22.65 | 0.290 | 10 16 26.4 | 2.30 |
| 8 | 22 40 20.17 | 0.296 | 10 16 46.1 | 2.34 | 8 15 29.7 | 22 40 15.52 | 0.304 | 10 17 22.7 | 2.38 |
| 9 | 22 40 12.91 | 0.310 | 10 17 43.2 | 2.42 | 9 15 25.7 | 22 40 8.06 | 0.318 | 10 18 20.9 | 2.46 |
| 10 | 22 40 5.31 | 0.324 | 10 18 42.2 | 2.50 | 10 15 21.6 | 22 40 0.27 | 0.332 | 10 19 20.9 | 2.54 |
| 11 | 22 39 57.38 | 0.338 | 10 19 43.0 | 2.57 | 11 15 17.6 | 22 39 52.14 | 0.346 | 10 20 22.8 | 2.62 |
| 12 | 22 39 49.11 | 0.352 | 10 20 45.7 | 2.65 | 12 15 13.5 | 22 39 43.68 | 0.359 | 10 21 26.5 | 2.69 |
| 13 | 22 39 40.50 | 0.366 | 10 21 50.2 | 2.73 | 13 15 9.4 | 22 39 34.89 | 0.373 | 10 22 32.0 | 2.77 |
| 14 | 22 39 31.56 | 0.379 | 10 22 56.6 | 2.80 | 14 15 5.3 | 22 39 25.77 | 0.386 | 10 23 39.3 | 2.84 |
| 15 | 22 39 22.30 | 0.392 | 10 24 4.8 | 2.88 | 15 15 1.2 | 22 39 16.34 | 0.399 | 10 24 48.3 | 2.91 |
| 16 | 22 39 12.73 | 0.405 | 10 25 14.7 | 2.95 | 16 14 57.1 | 22 39 6.61 | 0.412 | 10 25 59.0 | 2.98 |
| 17 | 22 39 2.85 | 0.418 | 10 26 26.2 | 3.01 | 17 14 53.0 | 22 38 56.57 | 0.425 | 10 27 11.3 | 3.05 |
| 18 | 22 38 52.67 | 0.431 | 10 27 39.4 | 3.08 | 18 14 48.9 | 22 38 46.23 | 0.437 | 10 28 25.3 | 3.12 |
| 19 | 22 38 42.18 | 0.443 | 10 28 54.2 | 3.15 | 19 14 44.8 | 22 38 35.59 | 0.450 | 10 29 41.0 | 3.19 |
| 20 | 22 38 31.39 | 0.456 | 10 30 10.7 | 3.22 | 20 14 40.7 | 22 38 24.65 | 0.462 | 10 30 58.3 | 3.25 |
| 21 | 22 38 20.30 | 0.468 | 10 31 28.8 | 3.29 | 21 14 36.6 | 22 38 13.41 | 0.474 | 10 32 17.1 | 3.31 |
| 22 | 22 38 8.92 | 0.480 | 10 32 48.4 | 3.35 | 22 14 32.5 | 22 38 1.89 | 0.486 | 10 33 37.4 | 3.37 |
| 23 | 22 37 57.26 | 0.492 | 10 34 9.5 | 3.41 | 23 14 28.3 | 22 37 50.09 | 0.497 | 10 34 59.1 | 3.43 |
| 24 | 22 37 45.32 | 0.503 | 10 35 32.0 | 3.47 | 24 14 24.2 | 22 37 38.02 | 0.508 | 10 36 22.2 | 3.49 |
| 25 | 22 37 33.11 | 0.514 | 10 36 55.9 | 3.52 | 25 14 20.1 | 22 37 25.69 | 0.519 | 10 37 46.7 | 3.55 |
| 26 | 22 37 20.64 | 0.525 | 10 38 21.2 | 3.58 | 26 14 15.9 | 22 37 13.10 | 0.530 | 10 39 12.5 | 3.60 |
| 27 | 22 37 7.91 | 0.536 | 10 39 47.9 | 3.64 | 27 14 11.8 | 22 37 0.25 | 0.540 | 10 40 39.7 | 3.66 |
| 28 | 22 36 54.92 | 0.546 | 10 41 15.9 | 3.69 | 28 14 7.6 | 22 36 47.16 | 0.550 | 10 42 8.2 | 3.71 |
| 29 | 22 36 41.69 | 0.556 | 10 42 45.1 | 3.74 | 29 14 3.5 | 22 36 33.83 | 0.560 | 10 43 37.9 | 3.76 |
| 30 | 22 36 28.22 | 0.566 | 10 44 15.5 | 3.79 | 20 13 59.3 | 22 36 20.26 | 0.570 | 10 45 8.7 | 3.81 |
| 31 | 22 36 14.52 | 0.576 | 10 45 47.0 | 3.84 | 31 13 55.1 | 22 36 6.46 | 0.580 | 10 46 40.6 | 3.85 |
| Aug. 1 | 22 36 0.59 | 0.585 | 10 47 19.6 | 3.88 | 1 13 51.0 | 22 35 52.44 | 0.589 | 10 48 13.6 | 3.90 |
| 2 | 22 35 46.44 | 0.594 | 10 48 53.3 | 3.93 | 2 13 46.8 | 22 35 38.21 | 0.597 | 10 49 47.6 | 3.94 |
| 3 | 22 35 32.07 | 0.603 | 10 50 28.0 | 3.97 | 3 13 42.6 | 22 35 23.77 | 0.606 | 10 51 22.5 | 3.97 |
| 4 | 22 35 17.50 | 0.611 | 10 52 3.6 | 4.00 | 4 13 38.5 | 22 35 9.13 | 0.614 | 10 52 58.3 | 4.01 |
| 5 | 22 35 2.73 | 0.619 | 10 53 40.1 | 4.04 | 5 13 34.3 | 22 34 54.30 | 0.622 | 10 54 35.0 | 4.05 |
| 6 | 22 34 47.77 | 0.627 | 10 55 17.5 | 4.08 | 6 13 30.1 | 22 34 39.27 | 0.630 | 10 56 12.7 | 4.09 |
| 7 | 22 34 32.62 | 0.635 | 10 56 55.8 | 4.11 | 7 13 25.9 | 22 34 24.06 | 0.637 | 10 57 51.3 | 4.12 |
| 8 | 22 34 17.29 | 0.642 | 10 58 35.0 | 4.15 | 8 13 21.7 | 22 34 8.68 | 0.644 | 10 59 30.6 | 4.15 |
| 9 | 22 34 1.79 | 0.649 | 11 0 14.9 | 4.18 | 9 13 17.6 | 22 33 53.13 | 0.651 | 11 1 10.5 | 4.17 |
| 10 | 22 33 46.12 | 0.656 | 11 1 55.4 | 4.20 | 10 13 13.4 | 22 33 37.41 | 0.658 | 11 2 51.0 | 4.20 |
| 11 | 22 33 30.29 | 0.663 | 11 3 36.5 | 4.23 | 11 13 9.2 | 22 33 21.54 | 0.664 | 11 4 32.1 | 4.23 |
| 12 | 22 33 14.31 | 0.669 | 11 5 18.2 | 4.25 | 12 13 5.0 | 22 33 5.53 | 0.670 | 11 6 13.9 | 4.25 |
| 13 | 22 32 58.19 | 0.674 | 11 7 0.5 | 4.27 | 13 13 0.8 | 22 32 49.39 | 0.675 | 11 7 56.2 | 4.27 |
| 14 | 22 32 41.94 | 0.680 | 11 8 43.3 | 4.29 | 14 12 56.6 | 22 32 33.12 | 0.681 | 11 9 38.9 | 4.29 |
| 15 | 22 32 25.57 | 0.685 | 11 10 26.5 | 4.31 | 15 12 52.4 | 22 32 16.72 | 0.686 | 11 11 22.0 | 4.30 |
| 16 | 22 32 9.08 | 0.690 | 11 12 10.1 | 4.33 | 16 12 48.2 | 22 32 0.21 | 0.690 | 11 13 5.5 | 4.32 |
| 17 | 22 31 52.47 | 0.694 | 11 13 54.1 | 4.34 | 17 12 44.0 | 22 31 43.60 | 0.694 | 11 14 49.4 | 4.33 |
| 18 | 22 31 35.76 | 0.698 | 11 15 38.4 | 4.35 | 18 12 39.8 | 22 31 26.90 | 0.698 | 11 16 33.5 | 4.34 |
| 19 | 22 31 18.96 | 0.701 | 11 17 22.9 | 4.36 | 19 12 35.5 | 22 31 10.12 | 0.701 | 11 18 17.7 | 4.35 |
| 20 | 22 31 2.09 | 0.704 | 11 19 7.5 | 4.36 | 20 12 31.3 | 22 30 53.26 | 0.704 | 11 20 2.1 | 4.35 |
| 21 | 22 30 45.15 | 0.707 | 11 20 52.2 | 4.36 | 21 12 27.1 | 22 30 36.33 | 0.707 | 11 21 46.6 | 4.36 |
| 22 | 22 30 28.14 | 0.710 | 11 22 37.0 | 4.37 | 22 12 22.9 | 22 30 19.34 | 0.709 | 11 23 31.1 | 4.35 |
| 23 | 22 30 11.07 | 0.712 | 11 24 21.8 | 4.36 | 23 12 18.7 | 22 30 2.30 | 0.711 | 11 25 15.5 | 4.35 |
| 24 | 22 29 53.96 | 0.714 | 11 26 6.5 | 4.36 | 24 12 14.5 | 22 29 45.22 | 0.712 | 11 26 59.9 | 4.35 |
| 25 | 22 29 36.81 | 0.715 | 11 27 51.1 | 4.35 | 25 12 10.3 | 22 29 28.11 | 0.713 | 11 28 44.1 | 4.34 |
| 26 | 22 29 19.64 | 0.716 | 11 29 35.5 | 4.35 | 26 12 6.0 | 22 29 10.98 | 0.714 | 11 30 28.1 | 4.33 |
| 27 | 22 29 2.46 | 0.716 | 11 31 19.7 | 4.34 | 27 12 1.8 | 22 28 53.85 | 0.714 | 11 32 11.9 | 4.32 |
| 28 | 22 28 45.28 | 0.716 | 11 33 3.7 | 4.33 | 28 11 57.6 | 22 28 36.72 | 0.714 | 11 33 55.4 | 4.30 |
| 29 | 22 28 28.10 | 0.716 | 11 34 47.4 | 4.31 | 29 11 53.4 | 22 28 19.59 | 0.714 | 11 35 38.5 | 4.29 |
| 30 | 22 28 10.93 | 0.715 | 11 36 30.6 | 4.29 | 30 11 49.2 | 22 28 2.47 | 0.713 | 11 37 21.2 | 4.27 |
| 31 | 22 27 53.77 | -0.715 | -11 38 13.3 | -4.27 | 31 11 45.0 | 22 27 45.37 | -0.712 | -11 39 3.4 | -4.25 |

# SATURN, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Sept. 1 | 22 27 36.63 | -0.714 | -11 39 55.5 | -4.25 | 1 11 40.7 | 22 27 28.30 | -0.711 | -11 40 45.1 | -4.22 |
| 2 | 22 27 19.52 | 0.712 | 11 41 37.2 | 4.22 | 2 11 36.5 | 22 27 11.26 | 0.709 | 11 42 26.2 | 4.20 |
| 3 | 22 27 2.46 | 0.710 | 11 43 18.3 | 4.20 | 3 11 32.3 | 22 26 54.27 | 0.706 | 11 44 6.7 | 4.17 |
| 4 | 22 26 45.46 | 0.707 | 11 44 58.7 | 4.17 | 4 11 28.1 | 22 26 37.35 | 0.703 | 11 45 46.6 | 4.15 |
| 5 | 22 26 28.53 | 0.704 | 11 46 38.5 | 4.15 | 5 11 23.9 | 22 26 20.50 | 0.700 | 11 47 25.8 | 4.12 |
| 6 | 22 26 11.67 | 0.701 | 11 48 17.7 | 4.12 | 6 11 19.7 | 22 26 3.73 | 0.697 | 11 49 4.3 | 4.09 |
| 7 | 22 25 54.89 | 0.697 | 11 49 56.2 | 4.09 | 7 11 15.5 | 22 25 47.04 | 0.694 | 11 50 42.1 | 4.06 |
| 8 | 22 25 38.20 | 0.693 | 11 51 33.8 | 4.05 | 8 11 11.3 | 22 25 30.44 | 0.690 | 11 52 19.0 | 4.02 |
| 9 | 22 25 21.60 | 0.689 | 11 53 10.4 | 4.01 | 9 11 7.0 | 22 25 13.94 | 0.685 | 11 53 55.0 | 3.98 |
| 10 | 22 25 5.11 | 0.684 | 11 54 46.1 | 3.97 | 10 11 2.8 | 22 24 57.55 | 0.681 | 11 55 30.0 | 3.94 |
| 11 | 22 24 48.73 | 0.680 | 11 56 20.9 | 3.93 | 11 10 58.6 | 22 24 41.27 | 0.676 | 11 57 4.0 | 3.90 |
| 12 | 22 24 32.47 | 0.675 | 11 57 54.7 | 3.89 | 12 10 54.4 | 22 24 25.12 | 0.670 | 11 58 37.0 | 3.85 |
| 13 | 22 24 16.34 | 0.669 | 11 59 27.4 | 3.84 | 13 10 50.2 | 22 24 9.11 | 0.664 | 12 0 8.9 | 3.81 |
| 14 | 22 24 0.36 | 0.663 | 12 0 59.0 | 3.79 | 14 10 46.0 | 22 23 53.24 | 0.658 | 12 1 39.7 | 3.76 |
| 15 | 22 23 44.53 | 0.656 | 12 2 29.4 | 3.74 | 15 10 41.8 | 22 23 37.52 | 0.652 | 12 3 9.3 | 3.71 |
| 16 | 22 23 28.85 | 0.650 | 12 3 58.6 | 3.69 | 16 10 37.7 | 22 23 21.96 | 0.645 | 12 4 37.7 | 3.66 |
| 17 | 22 23 13.34 | 0.643 | 12 5 26.6 | 3.64 | 17 10 33.5 | 22 23 6.57 | 0.638 | 12 6 4.9 | 3.61 |
| 18 | 22 22 58.01 | 0.635 | 12 6 53.3 | 3.58 | 18 10 29.3 | 22 22 51.36 | 0.630 | 12 7 30.8 | 3.55 |
| 19 | 22 22 42.86 | 0.627 | 12 8 18.6 | 3.52 | 19 10 25.1 | 22 22 36.34 | 0.622 | 12 8 55.3 | 3.49 |
| 20 | 22 22 27.91 | 0.619 | 12 9 42.5 | 3.47 | 20 10 20.9 | 22 22 21.52 | 0.613 | 12 10 18.3 | 3.43 |
| 21 | 22 22 13.16 | 0.610 | 12 11 5.0 | 3.41 | 21 10 16.8 | 22 22 6.90 | 0.605 | 12 11 39.9 | 3.37 |
| 22 | 22 21 58.62 | 0.601 | 12 12 26.0 | 3.34 | 22 10 12.6 | 22 21 52.50 | 0.595 | 12 13 0.0 | 3.31 |
| 23 | 22 21 44.30 | 0.592 | 12 13 45.5 | 3.28 | 23 10 8.4 | 22 21 38.32 | 0.586 | 12 14 18.6 | 3.24 |
| 24 | 22 21 30.21 | 0.582 | 12 15 3.4 | 3.21 | 24 10 4.3 | 22 21 24.36 | 0.577 | 12 15 35.6 | 3.18 |
| 25 | 22 21 16.35 | 0.573 | 12 16 19.7 | 3.15 | 25 10 0.1 | 22 21 10.64 | 0.567 | 12 16 51.0 | 3.11 |
| 26 | 22 21 2.73 | 0.563 | 12 17 34.4 | 3.08 | 26 9 55.9 | 22 20 57.16 | 0.557 | 12 18 4.8 | 3.04 |
| 27 | 22 20 49.35 | 0.552 | 12 18 47.5 | 3.01 | 27 9 51.8 | 22 20 43.92 | 0.547 | 12 19 17.0 | 2.97 |
| 28 | 22 20 36.22 | 0.541 | 12 19 58.9 | 2.94 | 28 9 47.6 | 22 20 30.93 | 0.536 | 12 20 27.5 | 2.90 |
| 29 | 22 20 23.36 | 0.530 | 12 21 8.5 | 2.86 | 29 9 43.5 | 22 20 18.21 | 0.524 | 12 21 36.2 | 2.83 |
| 30 | 22 20 10.77 | 0.519 | 12 22 16.4 | 2.79 | 30 9 39.4 | 22 20 5.77 | 0.513 | 12 22 43.2 | 2.75 |
| Oct. 1 | 22 19 58.45 | 0.508 | 12 23 22.5 | 2.72 | 1 9 35.2 | 22 19 53.60 | 0.501 | 12 23 48.4 | 2.68 |
| 2 | 22 19 46.41 | 0.496 | 12 24 26.8 | 2.64 | 2 9 31.1 | 22 19 41.71 | 0.490 | 12 24 51.8 | 2.60 |
| 3 | 22 19 34.65 | 0.484 | 12 25 29.2 | 2.56 | 3 9 27.0 | 22 19 30.10 | 0.478 | 12 25 53.3 | 2.52 |
| 4 | 22 19 23.18 | 0.472 | 12 26 29.8 | 2.49 | 4 9 22.9 | 22 19 18.78 | 0.465 | 12 26 53.0 | 2.44 |
| 5 | 22 19 12.01 | 0.459 | 12 27 28.5 | 2.41 | 5 9 18.7 | 22 19 7.76 | 0.453 | 12 27 50.8 | 2.37 |
| 6 | 22 19 1.14 | 0.446 | 12 28 25.4 | 2.33 | 6 9 14.6 | 22 18 57.04 | 0.440 | 12 28 46.8 | 2.29 |
| 7 | 22 18 50.58 | 0.434 | 12 29 20.4 | 2.25 | 7 9 10.5 | 22 18 46.63 | 0.427 | 12 29 40.9 | 2.21 |
| 8 | 22 18 40.33 | 0.420 | 12 30 13.4 | 2.17 | 8 9 6 4 | 22 18 36.53 | 0.414 | 12 30 33.0 | 2.13 |
| 9 | 22 18 30.40 | 0.407 | 12 31 4.4 | 2.08 | 9 9 2.3 | 22 18 26.75 | 0.401 | 12 31 23.1 | 2.04 |
| 10 | 22 18 20.79 | 0.394 | 12 31 53.3 | 2.00 | 10 8 58.2 | 22 18 17.29 | 0.388 | 12 32 11.1 | 1.96 |
| 11 | 22 18 11.51 | 0.380 | 12 32 40.2 | 1.91 | 11 8 54.2 | 22 18 8.15 | 0.374 | 12 32 57.1 | 1.87 |
| 12 | 22 18 2.56 | 0.366 | 12 33 25.0 | 1.82 | 12 8 50.1 | 22 17 59.35 | 0.360 | 12 33 41.0 | 1.79 |
| 13 | 22 17 53.95 | 0.351 | 12 34 7.7 | 1.74 | 13 8 46.0 | 22 17 50.89 | 0.345 | 12 34 22.8 | 1.70 |
| 14 | 22 17 45.69 | 0.337 | 12 34 48.3 | 1.65 | 14 8 41.9 | 22 17 42.78 | 0.331 | 12 35 2.6 | 1.61 |
| 15 | 22 17 37.78 | 0.322 | 12 35 26.9 | 1.56 | 15 8 37.9 | 22 17 35.01 | 0.316 | 12 35 40.3 | 1.53 |
| 16 | 22 17 30.21 | 0.308 | 12 36 3.4 | 1.47 | 16 8 33.8 | 22 17 27.59 | 0.302 | 12 36 15.9 | 1.44 |
| 17 | 22 17 23.00 | 0.293 | 12 36 37.7 | 1.38 | 17 8 29.8 | 22 17 20.53 | 0.287 | 12 36 49.3 | 1.35 |
| 18 | 22 17 16.16 | 0.278 | 12 37 9.8 | 1.29 | 18 8 25.7 | 22 17 13.83 | 0.271 | 12 37 20.5 | 1.25 |
| 19 | 22 17 9.68 | 0.262 | 12 37 39.7 | 1.20 | 19 8 21.7 | 22 17 7.50 | 0.256 | 12 37 49.5 | 1.16 |
| 20 | 22 17 3.57 | 0.247 | 12 38 7.4 | 1.11 | 20 8 17.6 | 22 17 1.54 | 0.240 | 12 38 16.4 | 1.07 |
| 21 | 22 16 57.84 | 0.231 | 12 38 32.8 | 1.01 | 21 8 13.6 | 22 16 55.96 | 0.225 | 12 38 41.0 | 0.98 |
| 22 | 22 16 52.49 | 0.215 | 12 38 56.0 | 0.92 | 22 8 9.6 | 22 16 50.75 | 0.209 | 12 39 3.4 | 0.89 |
| 23 | 22 16 47.51 | 0.200 | 12 39 17.0 | 0.83 | 23 8 5.6 | 22 16 45.91 | 0.194 | 12 39 23.6 | 0.79 |
| 24 | 22 16 42.91 | 0.184 | 12 39 35.7 | 0.73 | 24 8 1.6 | 22 16 41.45 | 0.178 | 12 39 41.5 | 0.70 |
| 25 | 22 16 38.70 | 0.168 | 12 39 52.2 | 0.64 | 25 7 57.6 | 22 16 37.37 | 0.162 | 12 39 57.2 | 0.61 |
| 26 | 22 16 34.87 | 0.151 | 12 40 6.5 | 0.55 | 26 7 53.6 | 22 16 33.68 | 0.146 | 12 40 10.7 | 0.51 |
| 27 | 22 16 31.43 | 0.135 | 12 40 18.5 | 0.45 | 27 7 49.6 | 22 16 30.38 | 0.129 | 12 40 21.9 | 0.42 |
| 28 | 22 16 28.38 | 0.119 | 12 40 28.2 | 0.36 | 28 7 45.6 | 22 16 27.47 | 0.113 | 12 40 30.8 | 0.32 |
| 29 | 22 16 25.72 | 0.103 | 12 40 35.7 | 0.26 | 29 7 41.7 | 22 16 24.95 | 0.097 | 12 40 37.5 | 0.23 |
| 30 | 22 16 23.45 | 0.086 | 12 40 40.9 | 0.17 | 30 7 37.1 | 22 16 22.81 | 0.081 | 12 40 42.0 | 0.14 |
| 31 | 22 16 21.57 | 0.070 | 12 40 43.8 | -0.07 | 31 7 33.8 | 22 16 21.06 | 0.065 | 12 40 44.2 | -0.04 |
| 32 | 22 16 20.08 | -0.054 | -12 40 44.4 | +0.02 | 32 7 29.8 | 22 16 19.70 | -0.049 | -12 40 44.1 | +0.05 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Nov. 1 | 22 16 20.08 | −0.054 | −12 40 44.4 | +0.02 | 1 7 29.8 | 22 16 19.70 | −0.049 | −12 40 44.1 | +0.05 |
| 2 | 22 16 18.99 | 0.037 | 12 40 42.8 | 0.11 | 2 7 25.8 | 22 16 18.73 | 0.032 | 12 40 41.8 | 0.14 |
| 3 | 22 16 18.29 | 0.021 | 12 40 38.9 | 0.21 | 3 7 21.9 | 22 16 18.16 | −0.016 | 12 40 37.2 | 0.24 |
| 4 | 22 16 17.99 | −0.004 | 12 40 32.7 | 0.31 | 4 7 18.0 | 22 16 17.98 | +0.001 | 12 40 30.3 | 0.33 |
| 5 | 22 16 18.09 | +0.012 | 12 40 24.2 | 0.40 | 5 7 14.0 | 22 16 18.20 | 0.017 | 12 40 21.2 | 0.42 |
| 6 | 22 16 18.58 | 0.029 | 12 40 13.5 | 0.49 | 6 7 10.1 | 22 16 18.81 | 0.034 | 12 40 9.9 | 0.52 |
| 7 | 22 16 19.47 | 0.045 | 12 40 0.5 | 0.59 | 7 7 6.2 | 22 16 19.82 | 0.050 | 12 39 56.3 | 0.61 |
| 8 | 22 16 20.76 | 0.062 | 12 39 45.3 | 0.68 | 8 7 2.3 | 22 16 21.23 | 0.067 | 12 39 40.4 | 0.71 |
| 9 | 22 16 22.45 | 0.079 | 12 39 27.8 | 0.78 | 9 6 58.4 | 22 16 23.03 | 0.083 | 12 39 22.3 | 0.80 |
| 10 | 22 16 24.54 | 0.096 | 12 39 8.0 | 0.87 | 10 6 54.5 | 22 16 25.23 | 0.100 | 12 39 1.9 | 0.90 |
| 11 | 22 16 27.04 | 0.112 | 12 38 45.9 | 0.97 | 11 6 50.6 | 22 16 27.83 | 0.117 | 12 38 39.2 | 0.99 |
| 12 | 22 16 29.94 | 0.129 | 12 38 21.5 | 1.06 | 12 6 46.7 | 22 16 30.83 | 0.133 | 12 38 14.2 | 1.09 |
| 13 | 22 16 33.23 | 0.145 | 12 37 54.9 | 1.16 | 13 6 42.8 | 22 16 34.22 | 0.150 | 12 37 47.0 | 1.18 |
| 14 | 22 16 36.92 | 0.162 | 12 37 26.0 | 1.25 | 14 6 39.0 | 22 16 38.01 | 0.166 | 12 37 17.6 | 1.27 |
| 15 | 22 16 41.01 | 0.179 | 12 36 54.9 | 1.34 | 15 6 35.1 | 22 16 42.20 | 0.183 | 12 36 45.9 | 1.37 |
| 16 | 22 16 45.50 | 0.195 | 12 36 21.5 | 1.44 | 16 6 31.3 | 22 16 46.79 | 0.199 | 12 36 12.0 | 1.46 |
| 17 | 22 16 50.39 | 0.212 | 12 35 45.9 | 1.53 | 17 6 27.4 | 22 16 51.77 | 0.216 | 12 35 35.9 | 1.55 |
| 18 | 22 16 55.68 | 0.229 | 12 35 8.0 | 1.62 | 18 6 23.6 | 22 16 57.15 | 0.232 | 12 34 57.6 | 1.64 |
| 19 | 22 17 1.36 | 0.245 | 12 34 27.9 | 1.72 | 19 6 19.7 | 22 17 2.92 | 0.248 | 12 34 17.0 | 1.74 |
| 20 | 22 17 7.44 | 0.261 | 12 33 45.6 | 1.81 | 20 6 15.9 | 22 17 9.09 | 0.265 | 12 33 34.2 | 1.83 |
| 21 | 22 17 13.91 | 0.278 | 12 33 1.1 | 1.90 | 21 6 12.1 | 22 17 15.65 | 0.281 | 12 32 49.2 | 1.92 |
| 22 | 22 17 20.77 | 0.294 | 12 32 14.4 | 1.99 | 22 6 8.3 | 22 17 22.60 | 0.297 | 12 32 2.1 | 2.01 |
| 23 | 22 17 28.02 | 0.310 | 12 31 25.5 | 2.08 | 23 6 4.5 | 22 17 29.93 | 0.313 | 12 31 12.8 | 2.10 |
| 24 | 22 17 35.66 | 0.326 | 12 30 34.4 | 2.17 | 24 6 0.7 | 22 17 37.64 | 0.329 | 12 30 21.3 | 2.19 |
| 25 | 22 17 43.68 | 0.342 | 12 29 41.2 | 2.26 | 25 5 56.9 | 22 17 45.73 | 0.345 | 12 29 27.7 | 2.28 |
| 26 | 22 17 52.08 | 0.358 | 12 28 45.8 | 2.35 | 26 5 53.1 | 22 17 54.20 | 0.361 | 12 28 31.9 | 2 37 |
| 27 | 22 18 0.86 | 0.374 | 12 27 48.3 | 2.44 | 27 5 49.3 | 22 18 3.05 | 0.376 | 12 27 34.0 | 2.46 |
| 28 | 22 18 10.01 | 0.389 | 12 26 48.7 | 2.53 | 28 5 45.5 | 22 18 12.27 | 0.392 | 12 26 34.0 | 2.54 |
| 29 | 22 18 19.54 | 0.405 | 12 25 47.0 | 2 61 | 29 5 41.7 | 22 18 21.86 | 0.407 | 12 25 32.0 | 2.62 |
| 30 | 22 18 29.44 | 0.420 | 12 24 43.3 | 2.70 | 30 5 38.0 | 22 18 31.82 | 0.423 | 12 24 28.0 | 2.71 |
| Dec. 1 | 22 18 39.71 | 0.435 | 12 23 37.6 | 2.78 | 1 5 34.2 | 22 18 42.15 | 0.438 | 12 23 22.0 | 2.79 |
| 2 | 22 18 50.34 | 0.451 | 12 22 29.8 | 2.87 | 2 5 30.4 | 22 18 52.84 | 0.453 | 12 22 14.0 | 2.88 |
| 3 | 22 19 1.34 | 0.466 | 12 21 20.0 | 2.95 | 3 5 26.7 | 22 19 3.89 | 0.468 | 12 21 3.9 | 2.96 |
| 4 | 22 19 12.70 | 0.481 | 12 20 8.1 | 3.04 | 4 5 22.9 | 22 19 15.29 | 0.482 | 12 19 51.8 | 3 05 |
| 5 | 22 19 24.41 | 0.495 | 12 18 54.2 | 3.12 | 5 5 19.2 | 22 19 27.05 | 0.497 | 12 18 37.6 | 3.13 |
| 6 | 22 19 36.47 | 0.510 | 12 17 38.3 | 3.20 | 6 5 15.5 | 22 19 39.16 | 0.512 | 12 17 21.4 | 3.21 |
| 7 | 22 19 48.89 | 0.525 | 12 16 20.4 | 3.29 | 7 5 11.8 | 22 19 51.62 | 0.526 | 12 16 3.3 | 3.29 |
| 8 | 22 20 1.66 | 0.539 | 12 15 0.6 | 3.37 | 8 5 8.0 | 22 20 4.43 | 0.541 | 12 14 43.3 | 3.37 |
| 9 | 22 20 14.78 | 0.554 | 12 13 38.9 | 3.45 | 9 5 4.3 | 22 20 17.59 | 0.556 | 12 13 21.4 | 3.45 |
| 10 | 22 20 28.25 | 0.568 | 12 12 15.2 | 3.53 | 10 5 0.6 | 22 20 31.10 | 0.570 | 12 11 57.5 | 3.53 |
| 11 | 22 20 42.06 | 0.582 | 12 10 49.6 | 3.61 | 11 4 56.9 | 22 20 44.95 | 0.584 | 12 10 31.7 | 3.61 |
| 12 | 22 20 56.21 | 0.596 | 12 9 22.1 | 3.69 | 12 4 53.2 | 22 20 59.13 | 0.598 | 12 9 4.0 | 3.69 |
| 13 | 22 21 10.69 | 0.610 | 12 7 52.7 | 3.76 | 13 4 49.5 | 22 21 13.65 | 0.612 | 12 7 34.4 | 3.77 |
| 14 | 22 21 25.51 | 0.624 | 12 6 21.4 | 3.84 | 14 4 45.8 | 22 21 28.50 | 0.625 | 12 6 3.0 | 3.85 |
| 15 | 22 21 40.66 | 0.638 | 12 4 48.3 | 3.92 | 15 4 42.2 | 22 21 43.67 | 0.639 | 12 4 29.8 | 3.92 |
| 16 | 22 21 56.13 | 0.651 | 12 3 13.3 | 4.00 | 16 4 38.5 | 22 21 59.16 | 0.652 | 12 2 54.7 | 4.00 |
| 17 | 22 22 11.92 | 0.665 | 12 1 36.5 | 4.07 | 17 4 34.8 | 22 22 14.97 | 0.665 | 12 1 17.8 | 4.07 |
| 18 | 22 22 28.03 | 0.678 | 11 59 58.0 | 4.14 | 18 4 31.2 | 22 22 31.10 | 0.678 | 11 59 39.2 | 4.15 |
| 19 | 22 22 44.45 | 0.691 | 11 58 17.7 | 4.22 | 19 4 27.5 | 22 22 47.54 | 0.691 | 11 57 58.8 | 4.22 |
| 20 | 22 23 1.18 | 0.703 | 11 56 35.6 | 4.29 | 20 4 23.8 | 22 23 4.28 | 0.704 | 11 56 16.7 | 4.29 |
| 21 | 22 23 18.21 | 0.715 | 11 54 51.8 | 4.36 | 21 4 20.2 | 22 23 21.32 | 0.716 | 11 54 32.9 | 4.36 |
| 22 | 22 23 35.54 | 0.728 | 11 53 6.3 | 4.43 | 22 4 16.5 | 22 23 38.66 | 0.729 | 11 52 47.4 | 4.43 |
| 23 | 22 23 53.17 | 0.741 | 11 51 19.2 | 4.50 | 23 4 12.9 | 22 23 56.29 | 0.741 | 11 51 0.2 | 4.50 |
| 24 | 22 24 11.09 | 0.753 | 11 49 30.4 | 4.57 | 24 4 9.3 | 22 24 14.22 | 0.753 | 11 49 11.4 | 4.57 |
| 25 | 22 24 29.30 | 0.765 | 11 47 40.0 | 4.63 | 25 4 5.6 | 22 24 32.44 | 0.765 | 11 47 21.0 | 4.63 |
| 26 | 22 24 47.80 | 0.777 | 11 45 48.0 | 4.70 | 26 4 2.0 | 22 24 50.94 | 0.776 | 11 45 29.0 | 4.70 |
| 27 | 22 25 6.58 | 0.788 | 11 43 54.5 | 4.76 | 27 3 58.4 | 22 25 9.71 | 0.788 | 11 43 35.5 | 4.76 |
| 28 | 22 25 25.63 | 0.799 | 11 41 59.4 | 4.83 | 28 3 54.8 | 22 25 28.75 | 0.799 | 11 41 40.4 | 4.83 |
| 29 | 22 25 44.94 | 0.810 | 11 40 2.7 | 4.89 | 29 3 51.2 | 22 25 48.06 | 0.810 | 11 39 43.8 | 4.89 |
| 30 | 22 26 4.52 | 0.821 | 11 38 4.5 | 4.96 | 30 3 47.6 | 22 26 7.64 | 0.821 | 11 37 45.7 | 4.95 |
| 31 | 22 26 24.36 | 0.832 | 11 36 4.8 | 5.02 | 31 3 44.0 | 22 26 27.47 | 0.831 | 11 35 46.1 | 5.01 |
| 32 | 22 26 44.46 | +0.843 | −11 34 3.7 | +5.08 | 32 3 40.4 | 22 26 47.55 | +0.842 | −11 33 45.0 | +5.07 |

# URANUS, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Jan. 0 | 9 28 18.69 | -0.298 | +15 41 47.6 | +1.51 | 0 14 46.9 | 9 28 14.26 | -0.300 | +15 42 10.1 | +1.53 |
| 1 | 9 28 11.47 | 0.304 | 15 42 24.2 | 1.54 | 1 14 42.9 | 9 28 6.97 | 0.307 | 15 42 47.0 | 1.55 |
| 2 | 9 28 4.10 | 0.310 | 15 43 1.5 | 1.57 | 2 14 38.8 | 9 27 59.53 | 0.312 | 15 43 24.6 | 1.58 |
| 3 | 9 27 56.57 | 0.316 | 15 43 39.4 | 1.59 | 3 14 34.8 | 9 27 51.93 | 0.319 | 15 44 2.8 | 1.60 |
| 4 | 9 27 48.88 | 0.322 | 15 44 18.0 | 1.62 | 4 14 30.8 | 9 27 44.18 | 0.326 | 15 44 41.6 | 1.63 |
| 5 | 9 27 41.05 | 0.329 | 15 44 57.2 | 1.65 | 5 14 26.7 | 9 27 36.28 | 0.332 | 15 45 21.1 | 1.66 |
| 6 | 9 27 33.08 | 0.335 | 15 45 37.0 | 1.67 | 6 14 22.7 | 9 27 28.25 | 0.337 | 15 46 1.1 | 1.68 |
| 7 | 9 27 24.97 | 0.340 | 15 46 17.4 | 1.69 | 7 14 18.5 | 9 27 20.08 | 0.343 | 15 46 41.7 | 1.70 |
| 8 | 9 27 16.73 | 0.346 | 15 46 58.4 | 1.72 | 8 14 14.5 | 9 27 11.78 | 0.349 | 15 47 22.9 | 1.73 |
| 9 | 9 27 8.35 | 0.352 | 15 47 39.9 | 1.74 | 9 14 10.4 | 9 27 3.34 | 0.354 | 15 48 4.6 | 1.75 |
| 10 | 9 26 59.84 | 0.357 | 15 48 22.0 | 1.76 | 10 14 6.3 | 9 26 54.78 | 0.359 | 15 48 46.9 | 1.77 |
| 11 | 9 26 51.21 | 0.362 | 15 49 4.6 | 1.78 | 11 14 2.2 | 9 26 46.10 | 0.364 | 15 49 29.7 | 1.79 |
| 12 | 9 26 42.46 | 0.367 | 15 49 47.6 | 1.81 | 12 13 58.1 | 9 26 37.31 | 0.369 | 15 50 12.9 | 1.81 |
| 13 | 9 26 33.60 | 0.372 | 15 50 31.2 | 1.83 | 13 13 54.1 | 9 26 28.40 | 0.374 | 15 50 56.7 | 1.83 |
| 14 | 9 26 24.61 | 0.377 | 15 51 15.3 | 1.85 | 14 13 50.0 | 9 26 19.37 | 0.379 | 15 51 40.9 | 1.85 |
| 15 | 9 26 15.51 | 0.382 | 15 51 59.9 | 1.87 | 15 13 45.9 | 9 26 10.23 | 0.383 | 15 52 25.6 | 1.87 |
| 16 | 9 26 6.31 | 0.386 | 15 52 45.0 | 1.89 | 16 13 41.8 | 9 26 0.99 | 0.387 | 15 53 10.8 | 1.89 |
| 17 | 9 25 57.00 | 0.390 | 15 53 30.4 | 1.90 | 17 13 37.7 | 9 25 51.66 | 0.391 | 15 53 56.3 | 1.91 |
| 18 | 9 25 47.60 | 0.394 | 15 54 16.3 | 1.92 | 18 13 33.6 | 9 25 42.23 | 0.395 | 15 54 42.3 | 1.92 |
| 19 | 9 25 38.10 | 0.398 | 15 55 2.5 | 1.93 | 19 13 29.5 | 9 25 32.71 | 0.399 | 15 55 28.6 | 1.93 |
| 20 | 9 25 28.50 | 0.402 | 15 55 49.0 | 1.94 | 20 13 25.5 | 9 25 23.10 | 0.402 | 15 56 15.1 | 1.95 |
| 21 | 9 25 18.83 | 0.405 | 15 56 35.8 | 1.96 | 21 13 21.4 | 9 25 13.40 | 0.406 | 15 57 2.0 | 1.96 |
| 22 | 9 25 9.08 | 0.409 | 15 57 22.9 | 1.97 | 22 13 17.3 | 9 25 3.63 | 0.409 | 15 57 49.1 | 1.97 |
| 23 | 9 24 59.25 | 0.412 | 15 58 10.3 | 1.98 | 23 13 13.2 | 9 24 53.79 | 0.412 | 15 58 36.5 | 1.98 |
| 24 | 9 24 49.33 | 0.415 | 15 58 58.0 | 1.99 | 24 13 9.1 | 9 24 43.86 | 0.415 | 15 59 24.2 | 1.99 |
| 25 | 9 24 39.35 | 0.418 | 15 59 45.9 | 2.00 | 25 13 5.0 | 9 24 33.87 | 0.418 | 16 0 12.1 | 2.00 |
| 26 | 9 24 29.31 | 0.420 | 16 0 34.0 | 2.01 | 26 13 0.9 | 9 24 23.83 | 0.420 | 16 1 0.1 | 2.01 |
| 27 | 9 24 19.21 | 0.422 | 16 1 22.3 | 2.02 | 27 12 56.8 | 9 24 13.73 | 0.422 | 16 1 48.4 | 2.01 |
| 28 | 9 24 9.05 | 0.424 | 16 2 10.8 | 2.02 | 28 12 52.7 | 9 24 3.58 | 0.424 | 16 2 36.9 | 2.02 |
| 29 | 9 23 58.85 | 0.426 | 16 2 59.4 | 2.03 | 29 12 48.6 | 9 23 53.39 | 0.426 | 16 3 25.4 | 2.02 |
| 30 | 9 23 48.60 | 0.428 | 16 3 48.2 | 2.03 | 30 12 44.5 | 9 23 43.15 | 0.427 | 16 4 14.1 | 2.03 |
| 31 | 9 23 38.33 | 0.429 | 16 4 37.1 | 2.04 | 31 12 40.4 | 9 23 32.89 | 0.428 | 16 5 2.9 | 2.03 |
| Feb. 1 | 9 23 28.02 | 0.430 | 16 5 26.0 | 2.04 | 1 12 36.3 | 9 23 22.59 | 0.430 | 16 5 51.7 | 2.04 |
| 2 | 9 23 17.67 | 0.432 | 16 6 15.0 | 2.04 | 2 12 32.2 | 9 23 12.26 | 0.431 | 16 6 40.6 | 2.04 |
| 3 | 9 23 7.29 | 0.433 | 16 7 4.0 | 2.04 | 3 12 28.1 | 9 23 1.90 | 0.432 | 16 7 29.5 | 2.04 |
| 4 | 9 22 56.90 | 0.433 | 16 7 53.1 | 2.04 | 4 12 24.0 | 9 22 51.53 | 0.432 | 16 8 18.5 | 2.04 |
| 5 | 9 22 46.50 | 0.433 | 16 8 42.1 | 2.04 | 5 12 19.9 | 9 22 41.15 | 0.432 | 16 9 7.3 | 2.03 |
| 6 | 9 22 36.09 | 0.434 | 16 9 31.0 | 2.04 | 6 12 15.8 | 9 22 30.77 | 0.432 | 16 9 56.0 | 2.03 |
| 7 | 9 22 25.67 | 0.434 | 16 10 19.9 | 2.04 | 7 12 11.6 | 9 22 20.38 | 0.432 | 16 10 44.7 | 2.03 |
| 8 | 9 22 15.25 | 0.434 | 16 11 8.7 | 2.03 | 8 12 7.5 | 9 22 9.99 | 0.432 | 16 11 33.3 | 2.02 |
| 9 | 9 22 4.83 | 0.434 | 16 11 57.4 | 2.03 | 9 12 3.4 | 9 21 59.60 | 0.432 | 16 12 21.8 | 2.02 |
| 10 | 9 21 54.43 | 0.433 | 16 12 46.0 | 2.02 | 10 11 59.3 | 9 21 49.24 | 0.431 | 16 13 10.2 | 2.01 |
| 11 | 9 21 44.05 | 0.433 | 16 13 34.4 | 2.02 | 11 11 55.2 | 9 21 38.90 | 0.430 | 16 13 58.4 | 2.01 |
| 12 | 9 21 33.68 | 0.432 | 16 14 22.7 | 2.01 | 12 11 51.1 | 9 21 28.57 | 0.430 | 16 14 46.5 | 2.00 |
| 13 | 9 21 23.32 | 0.431 | 16 15 10.8 | 2.00 | 13 11 47.0 | 9 21 18.25 | 0.429 | 16 15 34.4 | 1.99 |
| 14 | 9 21 12.99 | 0.430 | 16 15 58.7 | 1.99 | 14 11 43.0 | 9 21 7.96 | 0.428 | 16 16 22.1 | 1.98 |
| 15 | 9 21 2.69 | 0.428 | 16 16 46.3 | 1.98 | 15 11 38.9 | 9 20 57.71 | 0.426 | 16 17 9.4 | 1.97 |
| 16 | 9 20 52.43 | 0.427 | 16 17 33.7 | 1.97 | 16 11 34.7 | 9 20 47.50 | 0.425 | 16 17 56.5 | 1.96 |
| 17 | 9 20 42.21 | 0.425 | 16 18 20.8 | 1.96 | 17 11 30.6 | 9 20 37.32 | 0.424 | 16 18 43.3 | 1.95 |
| 18 | 9 20 32.03 | 0.423 | 16 19 7.7 | 1.95 | 18 11 26.5 | 9 20 27.18 | 0.422 | 16 19 29.9 | 1.93 |
| 19 | 9 20 21.89 | 0.421 | 16 19 54.3 | 1.93 | 19 11 22.4 | 9 20 17.10 | 0.419 | 16 20 16.2 | 1.92 |
| 20 | 9 20 11.81 | 0.419 | 16 20 40.5 | 1.92 | 20 11 18.3 | 9 20 7.08 | 0.417 | 16 21 2.1 | 1.91 |
| 21 | 9 20 1.80 | 0.416 | 16 21 26.3 | 1.90 | 21 11 14.2 | 9 19 57.13 | 0.414 | 16 21 47.6 | 1.89 |
| 22 | 9 19 51.84 | 0.414 | 16 22 11.8 | 1.89 | 22 11 10.1 | 9 19 47.23 | 0.412 | 16 22 32.8 | 1.87 |
| 23 | 9 19 41.95 | 0.411 | 16 22 56.9 | 1.87 | 23 11 6.0 | 9 19 37.40 | 0.409 | 16 23 17.6 | 1.86 |
| 24 | 9 19 32.13 | 0.408 | 16 23 41.6 | 1.85 | 24 11 1.9 | 9 19 27.64 | 0.405 | 16 24 2.0 | 1.84 |
| 25 | 9 19 22.39 | 0.404 | 16 24 25.8 | 1.83 | 25 10 57.8 | 9 19 17.96 | 0.401 | 16 24 45.9 | 1.82 |
| 26 | 9 19 12.74 | 0.400 | 16 25 9.5 | 1.81 | 26 10 53.7 | 9 19 8.38 | 0.397 | 16 25 29.3 | 1.80 |
| 27 | 9 19 3.18 | 0.397 | 16 25 52.8 | 1.79 | 27 10 49.6 | 9 18 58.89 | 0.394 | 16 25 12.2 | 1.78 |
| 28 | 9 18 53.70 | 0.393 | 16 26 35.6 | 1.77 | 28 10 45.5 | 9 18 49.48 | 0.390 | 16 26 54.6 | 1.76 |
| 29 | 9 18 44.31 | 0.389 | 16 27 17.9 | 1.75 | 29 10 41.5 | 9 18 40.16 | 0.386 | 16 27 36.6 | 1.74 |
| 30 | 9 18 35.03 | -0.384 | +16 27 59.7 | +1.73 | 30 10 37.4 | 9 18 30.95 | -0.381 | +16 28 18.0 | +1.71 |

| Date. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1876. | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Mar. 1 | 9 18 35.03 | −0.384 | +16 27 59.7 | +1.73 | 1 10 37.4 | 9 18 30.95 | −0 381 | +16 28 18.0 | +1.71 |
| 2 | 9 18 25.86 | 0.380 | 16 28 40.9 | 1.71 | 2 10 33.3 | 9 18 21.85 | 0.377 | 16 28 58.9 | 1.69 |
| 3 | 9 18 16.79 | 0.376 | 16 29 21.5 | 1.68 | 3 10 29.2 | 9 18 12.86 | 0.372 | 16 29 39.1 | 1.67 |
| 4 | 9 18 7.83 | 0.371 | 16 30 1.6 | 1.66 | 4 10 25.1 | 9 18 3.98 | 0.368 | 16 30 18.8 | 1.64 |
| 5 | 9 17 58.98 | 0.366 | 16 30 41.1 | 1.63 | 5 10 21.1 | 9 17 55.21 | 0.363 | 16 30 58.0 | 1.61 |
| 6 | 9 17 50.26 | 0.361 | 16 31 19.9 | 1.61 | 6 10 17.0 | 9 17 46.56 | 0.358 | 16 31 36.4 | 1.59 |
| 7 | 9 17 41.66 | 0.356 | 16 31 58.1 | 1.58 | 7 10 12.9 | 9 17 38.03 | 0.353 | 16 32 14.2 | 1.56 |
| 8 | 9 17 33.18 | 0.351 | 16 32 35.7 | 1.55 | 8 10 8.9 | 9 17 29.63 | 0.347 | 16 32 51.4 | 1.54 |
| 9 | 9 17 24.83 | 0.345 | 16 33 12.6 | 1.52 | 9 10 4.8 | 9 17 21.36 | 0.341 | 16 33 27.9 | 1.51 |
| 10 | 9 17 16.61 | 0.339 | 16 33 48.9 | 1.50 | 10 10 0.7 | 9 17 13.22 | 0.336 | 16 34 3.9 | 1.48 |
| 11 | 9 17 8.54 | 0.333 | 16 34 24.5 | 1.47 | 11 9 56.7 | 9 17 5.22 | 0.330 | 16 34 39.1 | 1.45 |
| 12 | 9 17 0.60 | 0.327 | 16 34 59.3 | 1.44 | 12 9 52.6 | 9 16 57.37 | 0.324 | 16 35 13.5 | 1.42 |
| 13 | 9 16 52.81 | 0.321 | 16 35 33.5 | 1.41 | 13 9 48.5 | 9 16 49.66 | 0.318 | 16 35 47.3 | 1.39 |
| 14 | 9 16 45.15 | 0.315 | 16 36 7.0 | 1.38 | 14 9 44.5 | 9 16 42.09 | 0.312 | 16 36 20.4 | 1.36 |
| 15 | 9 16 37.64 | 0.309 | 16 36 39.7 | 1.35 | 15 9 40.4 | 9 16 34.66 | 0.306 | 16 36 52.7 | 1.33 |
| 16 | 9 16 30.29 | 0.303 | 16 37 11.7 | 1.32 | 16 9 36.4 | 9 16 27.39 | 0.300 | 16 37 24.3 | 1.30 |
| 17 | 9 16 23.10 | 0.297 | 16 37 42.9 | 1.28 | 17 9 32.3 | 9 16 20.28 | 0.294 | 16 37 55.1 | 1.27 |
| 18 | 9 16 16.06 | 0.290 | 16 38 13.3 | 1.25 | 18 9 28.3 | 9 16 13.32 | 0.287 | 16 38 25.1 | 1.23 |
| 19 | 9 16 9.18 | 0.283 | 16 38 43.0 | 1.22 | 19 9 24.2 | 9 16 6.52 | 0.280 | 16 38 54.4 | 1.20 |
| 20 | 9 16 2.46 | 0.276 | 16 39 11.9 | 1.19 | 20 9 20.2 | 9 15 59.89 | 0.273 | 16 39 23.0 | 1.17 |
| 21 | 9 15 55.92 | 0.269 | 16 39 40.0 | 1.15 | 21 9 16.1 | 9 15 53.43 | 0.265 | 16 39 50.7 | 1.13 |
| 22 | 9 15 49.54 | 0.262 | 16 40 7.2 | 1.12 | 22 9 12.1 | 9 15 47.14 | 0.258 | 16 40 17.5 | 1.10 |
| 23 | 9 15 43.34 | 0.255 | 16 40 33.7 | 1.08 | 23 9 8.1 | 9 15 41.02 | 0.251 | 16 40 43 6 | 1.07 |
| 24 | 9 15 37.31 | 0.248 | 16 40 59.3 | 1.05 | 24 9 4.0 | 9 15 35.08 | 0.244 | 16 41 8.8 | 1.03 |
| 25 | 9 15 31.46 | 0.239 | 16 41 24.1 | 1.01 | 25 9 0.0 | 9 15 29.32 | 0.236 | 16 41 33.2 | 1.00 |
| 26 | 9 15 25.80 | 0.232 | 16 41 48.0 | 0.98 | 26 8 56.0 | 9 15 23.74 | 0.228 | 16 41 56.7 | 0.96 |
| 27 | 9 15 20.32 | 0.224 | 16 42 11.0 | 0.94 | 27 8 52.0 | 9 15 18.35 | 0.221 | 16 42 19.3 | 0.92 |
| 28 | 9 15 15.03 | 0.216 | 16 42 33.1 | 0.90 | 28 8 48.0 | 9 15 13.15 | 0.213 | 16 42 41.0 | 0.89 |
| 29 | 9 15 9.93 | 0.208 | 16 42 54.4 | 0.87 | 29 8 43.9 | 9 15 8.13 | 0.205 | 16 43 1.9 | 0.85 |
| 30 | 9 15 5.02 | 0.200 | 16 43 14.8 | 0.83 | 30 8 39.9 | 9 15 3 30 | 0.197 | 16 43 21.9 | 0.81 |
| 31 | 9 15 0.30 | 0.192 | 16 43 34.2 | 0.79 | 31 8 35.9 | 9 14 58.66 | 0.189 | 16 43 41.0 | 0.77 |
| Apr. 1 | 9 14 55.77 | 0.184 | 16 43 52.8 | 0.75 | 1 8 31.9 | 9 14 54.21 | 0.181 | 16 43 59.1 | 0.74 |
| 2 | 9 14 51.44 | 0.176 | 16 44 10.4 | 0.71 | 2 8 27.9 | 9 14 49.96 | 0.173 | 16 44 16.4 | 0.70 |
| 3 | 9 14 47.31 | 0.168 | 16 44 27.1 | 0.68 | 3 8 23.9 | 9 14 45.91 | 0.165 | 16 44 32.7 | 0.66 |
| 4 | 9 14 43.38 | 0.160 | 16 44 42.9 | 0.64 | 4 8 19.9 | 9 14 42.06 | 0.156 | 16 44 48.1 | 0.62 |
| 5 | 9 14 39.64 | 0.151 | 16 44 57.7 | 0.60 | 5 8 15.9 | 9 14 38.40 | 0.148 | 16 45 2.6 | 0.58 |
| 6 | 9 14 36.11 | 0.143 | 16 45 11.6 | 0.56 | 6 8 11.9 | 9 14 34.95 | 0.140 | 16 45 16.1 | 0.55 |
| 7 | 9 14 32.78 | 0.134 | 16 45 24.6 | 0.52 | 7 8 8.0 | 9 14 31.70 | 0.131 | 16 45 28.8 | 0.51 |
| 8 | 9 14 29.65 | 0.126 | 16 45 36.7 | 0.48 | 8 8 4.0 | 9 14 28.64 | 0.123 | 16 45 40.5 | 0.47 |
| 9 | 9 14 26.72 | 0.118 | 16 45 47.8 | 0.44 | 9 8 0.0 | 9 14 25.79 | 0.114 | 16 45 51.2 | 0.43 |
| 10 | 9 14 24.01 | 0.109 | 16 45 58.0 | 0.40 | 10 7 56.0 | 9 14 23.15 | 0.105 | 16 46 1.1 | 0.39 |
| 11 | 9 14 21.50 | 0.100 | 16 46 7.2 | 0.36 | 11 7 52.1 | 9 14 20.72 | 0.097 | 16 46 10.0 | 0.35 |
| 12 | 9 14 19.19 | 0.091 | 16 46 15.5 | 0.32 | 12 7 48.1 | 9 14 18.49 | 0.088 | 16 46 18.0 | 0.31 |
| 13 | 9 14 17.10 | 0.083 | 16 46 22.8 | 0.29 | 13 7 44.1 | 9 14 16.47 | 0.079 | 16 46 25.0 | 0.27 |
| 14 | 9 14 15.22 | 0.074 | 16 46 29.2 | 0 25 | 14 7 40.2 | 9 14 14.67 | 0.070 | 16 46 31.1 | 0.23 |
| 15 | 9 14 13.54 | 0.065 | 16 46 34.6 | 0.21 | 15 7 36.2 | 9 14 13.06 | 0.062 | 16 46 36.2 | 0.19 |
| 16 | 9 14 12.08 | 0.056 | 16 46 39.0 | 0.17 | 16 7 32.2 | 9 14 11.67 | 0.053 | 16 46 40.3 | 0.15 |
| 17 | 9 14 10.84 | 0.048 | 16 46 42.5 | 0.13 | 17 7 28.3 | 9 14 10.50 | 0.045 | 16 46 43.5 | 0.11 |
| 18 | 9 14 9.80 | 0.039 | 16 46 45.1 | 0.08 | 18 7 24.3 | 9 14 9.53 | 0.036 | 16 46 45.7 | 0.07 |
| 19 | 9 14 8.98 | 0.029 | 16 46 46.6 | +0.04 | 19 7 20.4 | 9 14 8.78 | 0.027 | 16 46 46.9 | +0.03 |
| 20 | 9 14 8.37 | 0.020 | 16 46 47.2 | 0.00 | 20 7 16.5 | 9 14 8.24 | 0.018 | 16 46 47.2 | −0 01 |
| 21 | 9 14 7.98 | 0.011 | 16 46 46.8 | −0.04 | 21 7 12.5 | 9 14 7.92 | −0.009 | 16 46 46 5 | 0.05 |
| 22 | 9 14 7.81 | −0.003 | 16 46 45.4 | 0.08 | 22 7 8.6 | 9 14 7.81 | 0.000 | 16 46 44.8 | 0.09 |
| 23 | 9 14 7.85 | +0.006 | 16 46 43.1 | 0.12 | 23 7 4.7 | 9 14 7.91 | +0.009 | 16 46 42.2 | 0.13 |
| 24 | 9 14 8.11 | 0.015 | 16 46 39.8 | 0.16 | 24 7 0.7 | 9 14 8.23 | 0.018 | 16 46 38.6 | 0.17 |
| 25 | 9 14 8.58 | 0.024 | 16 46 35.5 | 0.20 | 25 6 56.8 | 9 14 8.76 | 0.027 | 16 46 34.1 | 0.21 |
| 26 | 9 14 9.27 | 0.033 | 16 46 30.2 | 0.24 | 26 6 52.9 | 9 14 9.51 | 0.036 | 16 46 28.5 | 0.25 |
| 27 | 9 14 10.18 | 0.043 | 16 46 24.0 | 0.28 | 27 6 49.0 | 9 14 10.47 | 0.045 | 16 46 22.0 | 0.29 |
| 28 | 9 14 11.30 | 0.051 | 16 46 16.8 | 0.32 | 28 6 45.1 | 9 14 11.65 | 0.054 | 16 46 14.6 | 0.33 |
| 29 | 9 14 12.64 | 0.060 | 16 46 8.6 | 0.36 | 29 6 41.2 | 9 14 13.05 | 0.062 | 16 46 6.1 | 0.37 |
| 30 | 9 14 14.19 | 0.069 | 16 45 59.4 | 0.40 | 30 6 37.3 | 9 14 14.66 | 0.071 | 16 45 56.7 | 0.41 |
| 31 | 9 14 15.95 | +0.078 | +16 45 49.3 | −0.44 | 31 6 33.4 | 9 14 16.47 | +0.080 | +16 45 46.3 | −0.45 |

# URANUS, 1876.

| Date. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1876. | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| May 1 | 9 14 15.95 | +0.078 | +16 45 49.3 | -0.44 | 1 6 33.4 | 9 14 16.47 | +0.080 | +16 45 46.3 | -0.45 |
| 2 | 9 14 17.93 | 0.086 | 16 45 38.2 | 0.48 | 2 6 29.5 | 9 14 18.50 | 0.089 | 16 45 35.0 | 0.49 |
| 3 | 9 14 20.12 | 0.096 | 16 45 26.1 | 0.52 | 3 6 25.6 | 9 14 20.74 | 0.098 | 16 45 22.7 | 0.53 |
| 4 | 9 14 22.53 | 0.105 | 16 45 13.1 | 0.56 | 4 6 21.7 | 9 14 23.20 | 0.107 | 16 45 9.5 | 0.57 |
| 5 | 9 14 25.15 | 0.114 | 16 44 59.1 | 0.60 | 5 6 17.8 | 9 14 25.87 | 0.115 | 16 44 55.3 | 0.61 |
| 6 | 9 14 27.97 | 0.122 | 16 44 44.2 | 0.64 | 6 6 13.9 | 9 14 28.74 | 0.124 | 16 44 40.2 | 0.65 |
| 7 | 9 14 31.01 | 0.131 | 16 44 28.3 | 0.68 | 7 6 10.0 | 9 14 31.83 | 0.133 | 16 44 24.1 | 0.69 |
| 8 | 9 14 34.26 | 0.140 | 16 44 11.5 | 0.72 | 8 6 6.1 | 9 14 35.12 | 0.142 | 16 44 7.1 | 0.73 |
| 9 | 9 14 37.72 | 0.149 | 16 43 53.8 | 0.76 | 9 6 2.3 | 9 14 38.62 | 0.150 | 16 43 49.2 | 0.77 |
| 10 | 9 14 41.38 | 0.157 | 16 43 35.1 | 0.80 | 10 5 58.4 | 9 14 42.32 | 0.158 | 16 43 30.3 | 0.81 |
| 11 | 9 14 45.25 | 0.166 | 16 43 15.5 | 0.83 | 11 5 54.5 | 9 14 46.23 | 0.167 | 16 43 10.5 | 0.84 |
| 12 | 9 14 49.33 | 0.174 | 16 42 55.0 | 0.87 | 12 5 50.7 | 9 14 50.35 | 0.176 | 16 42 49.8 | 0.88 |
| 13 | 9 14 53.62 | 0.182 | 16 42 33.6 | 0.91 | 13 5 46.8 | 9 14 54.68 | 0.184 | 16 42 28.3 | 0.92 |
| 14 | 9 14 58.11 | 0.191 | 16 42 11.3 | 0.95 | 14 5 42.9 | 9 14 59.21 | 0.192 | 16 42 5.8 | 0.96 |
| 15 | 9 15 2.80 | 0.199 | 16 41 48.0 | 0.99 | 15 5 39.1 | 9 15 3.94 | 0.201 | 16 41 42.4 | 0.99 |
| 16 | 9 15 7.70 | 0.208 | 16 41 23.9 | 1.03 | 16 5 35.2 | 9 15 8.87 | 0.209 | 16 41 18.1 | 1.03 |
| 17 | 9 15 12.80 | 0.216 | 16 40 58.8 | 1.06 | 17 5 31.4 | 9 15 14.00 | 0.219 | 16 40 52.9 | 1.07 |
| 18 | 9 15 18.10 | 0.225 | 16 40 32.8 | 1.10 | 18 5 27.6 | 9 15 19.33 | 0.226 | 16 40 26.8 | 1.11 |
| 19 | 9 15 23.60 | 0.233 | 16 40 5.9 | 1.14 | 19 5 23.8 | 9 15 24.86 | 0.234 | 16 39 59.7 | 1.14 |
| 20 | 9 15 29.30 | 0.241 | 16 39 38.2 | 1.18 | 20 5 19.9 | 9 15 30.59 | 0.243 | 16 39 31.8 | 1.18 |
| 21 | 9 15 35.19 | 0.250 | 16 39 9.5 | 1.21 | 21 5 16.0 | 9 15 36.51 | 0.251 | 16 39 3.1 | 1.22 |
| 22 | 9 15 41.28 | 0.258 | 16 38 39.9 | 1.25 | 22 5 12.2 | 9 15 42.63 | 0.259 | 16 38 33.4 | 1.25 |
| 23 | 9 15 47.56 | 0.266 | 16 38 9.5 | 1.29 | 23 5 8.4 | 9 15 48.93 | 0.267 | 16 38 2.9 | 1.29 |
| 24 | 9 15 54.04 | 0.274 | 16 37 38.2 | 1.32 | 24 5 4.6 | 9 15 55.43 | 0.275 | 16 37 31.5 | 1.33 |
| 25 | 9 16 0.70 | 0.281 | 16 37 6.0 | 1.36 | 25 5 0.7 | 9 16 2.11 | 0.283 | 16 36 59.2 | 1.36 |
| 26 | 9 16 7.56 | 0.290 | 16 36 33.0 | 1.39 | 26 4 56.9 | 9 16 8.99 | 0.291 | 16 36 26.1 | 1.40 |
| 27 | 9 16 14.60 | 0.297 | 16 35 59.1 | 1.43 | 27 4 53.1 | 9 16 16.05 | 0.298 | 16 35 52.1 | 1.43 |
| 28 | 9 16 21.83 | 0.305 | 16 35 24.4 | 1.46 | 28 4 49.3 | 9 16 23.30 | 0.306 | 16 35 17.3 | 1.47 |
| 29 | 9 16 29.24 | 0.312 | 16 34 48.8 | 1.50 | 29 4 45.5 | 9 16 30.73 | 0.313 | 16 34 41.6 | 1.50 |
| 30 | 9 16 36.84 | 0.319 | 16 34 12.4 | 1.53 | 30 4 41.7 | 9 16 38.35 | 0.320 | 16 34 5.1 | 1.54 |
| 31 | 9 16 44.61 | 0.327 | 16 33 35.2 | 1.57 | 31 4 37.9 | 9 16 46.13 | 0.327 | 16 33 27.9 | 1.57 |
| June 1 | 9 16 52.55 | 0.335 | 16 32 57.2 | 1.60 | 1 4 34.1 | 9 16 54.08 | 0.335 | 16 32 49.8 | 1.60 |
| 2 | 9 17 0.68 | 0.342 | 16 32 18.3 | 1.64 | 2 4 30.3 | 9 17 2.22 | 0.342 | 16 32 10.9 | 1.64 |
| 3 | 9 17 8.98 | 0.349 | 16 31 38.7 | 1.67 | 3 4 26.5 | 9 17 10.53 | 0.350 | 16 31 31.3 | 1.67 |
| 4 | 9 17 17.45 | 0.356 | 16 30 58.2 | 1.70 | 4 4 22.7 | 9 17 19.01 | 0.357 | 16 30 50.8 | 1.70 |
| 5 | 9 17 26.09 | 0.363 | 16 30 17.1 | 1.73 | 5 4 18.9 | 9 17 27.66 | 0.364 | 16 30 9.6 | 1.73 |
| 6 | 9 17 34.89 | 0.371 | 16 29 35.1 | 1.76 | 6 4 15.1 | 9 17 36.47 | 0.371 | 16 29 27.6 | 1.76 |
| 7 | 9 17 43.87 | 0.378 | 16 28 52.4 | 1.80 | 7 4 11.3 | 9 17 45.45 | 0.377 | 16 28 44.9 | 1.80 |
| 8 | 9 17 53.01 | 0.384 | 16 28 8.9 | 1.83 | 8 4 7.6 | 9 17 54.59 | 0.384 | 16 28 1.4 | 1.83 |
| 9 | 9 18 2.31 | 0.391 | 16 27 24.7 | 1.86 | 9 4 3.8 | 9 18 3.90 | 0.391 | 16 27 17.2 | 1.86 |
| 10 | 9 18 11.77 | 0.398 | 16 26 39.8 | 1.89 | 10 4 0.0 | 9 18 13.36 | 0.398 | 16 26 32.3 | 1.89 |
| 11 | 9 18 21.39 | 0.404 | 16 25 54.2 | 1.92 | 11 3 56.3 | 9 18 22.98 | 0.404 | 16 25 46.7 | 1.92 |
| 12 | 9 18 31.17 | 0.411 | 16 25 7.8 | 1.95 | 12 3 52.5 | 9 18 32.76 | 0.410 | 16 25 0.3 | 1.95 |
| 13 | 9 18 41.11 | 0.417 | 16 24 20.7 | 1.98 | 13 3 48.7 | 9 18 42.69 | 0.417 | 16 24 13.2 | 1.97 |
| 14 | 9 18 51.19 | 0.423 | 16 23 32.9 | 2.01 | 14 3 44.9 | 9 18 52.77 | 0.424 | 16 23 25.5 | 2.00 |
| 15 | 9 19 1.43 | 0.429 | 16 22 44.4 | 2.04 | 15 3 41.2 | 9 19 3.01 | 0.430 | 16 22 37.0 | 2.03 |
| 16 | 9 19 11.82 | 0.435 | 16 21 55.2 | 2.06 | 16 3 37.4 | 9 19 13.39 | 0.435 | 16 21 47.8 | 2.06 |
| 17 | 9 19 22.35 | 0.441 | 16 21 5.3 | 2.09 | 17 3 33.7 | 9 19 23.92 | 0.441 | 16 20 57.9 | 2.09 |
| 18 | 9 19 33.03 | 0.447 | 16 20 14.7 | 2.12 | 18 3 29.9 | 9 19 34.59 | 0.447 | 16 20 7.4 | 2.12 |
| 19 | 9 19 43.84 | 0.453 | 16 19 23.4 | 2.14 | 19 3 26.2 | 9 19 45.40 | 0.453 | 16 19 16.1 | 2.15 |
| 20 | 9 19 54.79 | 0.459 | 16 18 31.5 | 2.18 | 20 3 22.4 | 9 19 56.34 | 0.458 | 16 18 24.2 | 2.17 |
| 21 | 9 20 5.88 | 0.465 | 16 17 39.0 | 2.20 | 21 3 18.7 | 9 20 7.42 | 0.464 | 16 17 31.8 | 2.20 |
| 22 | 9 20 17.11 | 0.470 | 16 16 45.8 | 2.23 | 22 3 14.9 | 9 20 18.64 | 0.470 | 16 16 38.6 | 2.23 |
| 23 | 9 20 28.47 | 0.476 | 16 15 51.9 | 2.26 | 23 3 11.2 | 9 20 29.99 | 0.475 | 16 15 44.8 | 2.25 |
| 24 | 9 20 39.96 | 0.481 | 16 14 57.5 | 2.28 | 24 3 7.4 | 9 20 41.47 | 0.481 | 16 14 50.4 | 2.28 |
| 25 | 9 20 51.57 | 0.486 | 16 14 2.4 | 2.31 | 25 3 3.7 | 9 20 53.07 | 0.486 | 16 13 55.4 | 2.30 |
| 26 | 9 21 3.31 | 0.491 | 16 13 6.8 | 2.33 | 26 3 0.0 | 9 21 4.79 | 0.491 | 16 12 59.8 | 2.33 |
| 27 | 9 21 15.18 | 0.497 | 16 12 10.5 | 2.36 | 27 2 56.2 | 9 21 16.64 | 0.496 | 16 12 3.6 | 2.35 |
| 28 | 9 21 27.17 | 0.502 | 16 11 13.7 | 2.38 | 28 2 52.5 | 9 21 28.62 | 0.501 | 16 11 6.8 | 2.38 |
| 29 | 9 21 39.27 | 0.506 | 16 10 16.3 | 2.40 | 29 2 48.8 | 9 21 40.70 | 0.506 | 16 10 9.5 | 2.40 |
| 30 | 9 21 51.48 | 0.511 | 16 9 18.4 | 2.43 | 30 2 45.0 | 9 21 52.89 | 0.510 | 16 9 11.7 | 2.42 |
| 31 | 9 22 3.81 | +0.516 | +16 8 19.9 | -2.45 | 31 2 41.3 | 9 22 5.20 | +0.515 | +16 8 13.3 | -2.44 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| July 1 | 9 22 3.81 | +0.516 | +16 8 19.9 | −2.45 | 1 2 41.3 | 9 22 5.20 | +0.515 | +16 8 13.3 | −2.44 |
| 2 | 9 22 16.25 | 0.521 | 16 7 20.9 | 2.47 | 2 2 37.6 | 9 22 17.62 | 0.520 | 16 7 14.4 | 2.46 |
| 3 | 9 22 28.80 | 0.525 | 16 6 21.3 | 2.49 | 3 2 33.8 | 9 22 30.15 | 0.524 | 16 6 15.0 | 2.48 |
| 4 | 9 22 41.44 | 0.529 | 16 5 21.3 | 2.51 | 4 2 30.1 | 9 22 42.77 | 0.528 | 16 5 15.0 | 2.51 |
| 5 | 9 22 54.19 | 0.533 | 16 4 20.7 | 2.53 | 5 2 26.4 | 9 22 55.50 | 0.532 | 16 4 14.5 | 2.53 |
| 6 | 9 23 7.04 | 0.538 | 16 3 19.7 | 2.55 | 6 2 22.7 | 9 23 8.33 | 0.537 | 16 3 13.6 | 2.55 |
| 7 | 9 23 19.99 | 0.542 | 16 2 18.2 | 2.57 | 7 2 19.0 | 9 23 21.26 | 0.541 | 16 2 12.2 | 2.57 |
| 8 | 9 23 33.04 | 0.546 | 16 1 16.3 | 2.59 | 8 2 15.3 | 9 23 34.28 | 0.545 | 16 1 10.4 | 2.59 |
| 9 | 9 23 46.17 | 0.549 | 16 0 13.9 | 2.61 | 9 2 11.5 | 9 23 47.38 | 0.548 | 16 0 8.1 | 2.61 |
| 10 | 9 23 59.39 | 0.553 | 15 59 11.0 | 2.63 | 10 2 7.8 | 9 24 0.57 | 0.552 | 15 59 5.3 | 2.62 |
| 11 | 9 24 12.70 | 0.557 | 15 58 7.8 | 2.65 | 11 2 4.1 | 9 24 13.85 | 0.555 | 15 58 2.2 | 2.64 |
| 12 | 9 24 26.10 | 0.560 | 15 57 4.1 | 2.66 | 12 2 0.4 | 9 24 27.22 | 0.558 | 15 56 58.7 | 2.66 |
| 13 | 9 24 39.58 | 0.563 | 15 55 59.9 | 2.68 | 13 1 56.7 | 9 24 40.68 | 0.562 | 15 55 54.7 | 2.68 |
| 14 | 9 24 53.14 | 0.566 | 15 54 55.4 | 2.70 | 14 1 53.0 | 9 24 54.21 | 0.565 | 15 54 50.3 | 2.69 |
| 15 | 9 25 6.77 | 0.569 | 15 53 50.4 | 2.71 | 15 1 49.3 | 9 25 7.81 | 0.568 | 15 53 45.4 | 2.71 |
| 16 | 9 25 20.48 | 0.572 | 15 52 45.1 | 2.73 | 16 1 65.6 | 9 25 21.49 | 0.571 | 15 52 40.2 | 2.72 |
| 17 | 9 25 34.27 | 0.575 | 15 51 39.4 | 2.75 | 17 1 41.9 | 9 25 35.25 | 0.574 | 15 51 34.7 | 2.74 |
| 18 | 9 25 48.13 | 0.578 | 15 50 33.3 | 2.76 | 18 1 38.2 | 9 25 49.08 | 0.577 | 15 50 28.8 | 2.75 |
| 19 | 9 26 2.05 | 0.581 | 15 49 26.9 | 2.77 | 19 1 34.5 | 9 26 2.97 | 0.580 | 15 49 22.5 | 2.77 |
| 20 | 9 26 16.04 | 0.584 | 15 48 20.1 | 2.79 | 20 1 30.8 | 9 26 16.93 | 0.583 | 15 48 15.8 | 2.78 |
| 21 | 9 26 30.09 | 0.586 | 15 47 13.0 | 2.80 | 21 1 27.1 | 9 26 30.95 | 0.585 | 15 47 8.9 | 2.80 |
| 22 | 9 26 44.20 | 0.589 | 15 46 5.6 | 2.81 | 22 1 23.4 | 9 26 45.02 | 0.587 | 15 46 1.7 | 2.81 |
| 23 | 9 26 58.37 | 0.591 | 15 44 57.9 | 2.83 | 23 1 19.7 | 9 26 59.16 | 0.589 | 15 44 54.1 | 2.82 |
| 24 | 9 27 12.58 | 0.593 | 15 43 49.9 | 2.84 | 24 1 16.0 | 9 27 13.34 | 0.591 | 15 43 46.3 | 2.83 |
| 25 | 9 27 26.85 | 0.595 | 15 42 41.7 | 2.85 | 25 1 12.3 | 9 27 27.57 | 0.593 | 15 42 38.2 | 2.84 |
| 26 | 9 27 41.16 | 0.597 | 15 41 33.2 | 2.86 | 26 1 8.6 | 9 27 41.85 | 0.595 | 15 41 29.9 | 2.85 |
| 27 | 9 27 55.52 | 0.599 | 15 40 24.4 | 2.87 | 27 1 4.9 | 9 27 56.17 | 0.597 | 15 40 21.3 | 2.86 |
| 28 | 9 28 9.92 | 0.601 | 15 39 15.4 | 2.88 | 28 1 1.2 | 9 28 10.54 | 0.599 | 15 39 12.4 | 2.87 |
| 29 | 9 28 24.36 | 0.602 | 15 38 6.2 | 2.89 | 29 0 57.5 | 9 28 24.94 | 0.601 | 15 38 3.4 | 2.88 |
| 30 | 9 28 38.83 | 0.604 | 15 36 56.8 | 2.90 | 30 0 53.9 | 9 28 39.38 | 0.602 | 15 36 54.2 | 2.89 |
| 31 | 9 28 53.34 | 0.605 | 15 35 47.2 | 2.90 | 31 0 50.2 | 9 28 53.85 | 0.604 | 15 35 44.8 | 2.90 |
| Aug. 1 | 9 29 7.88 | 0.606 | 15 34 37.4 | 2.91 | 1 0 46.5 | 9 29 8.36 | 0.605 | 15 34 35.2 | 2.90 |
| 2 | 9 29 22.45 | 0.607 | 15 33 27.4 | 2.92 | 2 0 42.8 | 9 29 22.89 | 0.606 | 15 33 25.4 | 2.91 |
| 3 | 9 29 37.04 | 0.608 | 15 32 17.3 | 2.92 | 3 0 39.1 | 9 29 37.44 | 0.607 | 15 32 15.4 | 2.92 |
| 4 | 9 29 51.65 | 0.609 | 15 31 7.0 | 2.93 | 4 0 35.4 | 9 29 52.01 | 0.608 | 15 31 5.2 | 2.92 |
| 5 | 9 30 6.28 | 0.610 | 15 29 56.6 | 2.94 | 5 0 31.7 | 9 30 6.61 | 0.609 | 15 29 55.0 | 2.93 |
| 6 | 9 30 20.94 | 0.611 | 15 28 46.0 | 2.94 | 6 0 28.0 | 9 30 21.23 | 0.609 | 15 28 44.6 | 2.94 |
| 7 | 9 30 35.61 | 0.611 | 15 27 35.3 | 2.95 | 7 0 24.3 | 9 30 35.87 | 0.610 | 15 27 34.0 | 2.94 |
| 8 | 9 30 50.29 | 0.612 | 15 26 24.6 | 2.95 | 8 0 20.6 | 9 30 50.52 | 0.610 | 15 26 23.5 | 2.94 |
| 9 | 9 31 4.99 | 0.612 | 15 25 13.8 | 2.95 | 9 0 16.9 | 9 31 5.17 | 0.610 | 15 25 12.9 | 2.94 |
| 10 | 9 31 19.69 | 0.612 | 15 24 2.9 | 2.96 | 10 0 13.3 | 9 31 19.83 | 0.611 | 15 24 2.2 | 2.95 |
| 11 | 9 31 34.40 | 0.613 | 15 22 51.9 | 2.96 | 11 0 9.6 | 9 31 34.50 | 0.611 | 15 22 51.4 | 2.95 |
| 12 | 9 31 49.11 | 0.613 | 15 21 40.9 | 2.96 | 12 0 5.9 | 9 31 49.18 | 0.611 | 15 21 40.6 | 2.95 |
| 13 | 9 32 3.82 | 0.613 | 15 20 29.8 | 2.96 | 13 0 2.2 | 9 32 3.85 | 0.611 | 15 20 29.7 | 2.96 |
| | | | | | 13 23 58.5 | 9 32 18.52 | 0.611 | 15 19 18.9 | 2.95 |
| 14 | 9 32 18.53 | 0.612 | 15 19 18.8 | 2.96 | 14 23 54.8 | 9 32 33.18 | 0.611 | 15 18 8.0 | 2.95 |
| 15 | 9 32 33.23 | 0.612 | 15 18 7.7 | 2.96 | 15 23 51.2 | 9 32 47.84 | 0.610 | 15 16 57.1 | 2.95 |
| 16 | 9 32 47.93 | 0.612 | 15 16 56.6 | 2.96 | 16 23 47.5 | 9 33 2.49 | 0.610 | 15 15 46.3 | 2.95 |
| 17 | 9 33 2.62 | 0.611 | 15 15 45.6 | 2.96 | 17 23 43.8 | 9 33 17.12 | 0.609 | 15 14 35.5 | 2.95 |
| 18 | 9 33 17.29 | 0.611 | 15 14 34.6 | 2.96 | 18 23 40.1 | 9 33 31.73 | 0.608 | 15 13 24.6 | 2.95 |
| 19 | 9 33 31.94 | 0.610 | 15 13 23.6 | 2.95 | 19 23 36.4 | 9 33 46.32 | 0.607 | 15 12 13.9 | 2.95 |
| 20 | 9 33 46.57 | 0.609 | 15 12 12.7 | 2.95 | 20 23 32.7 | 9 34 0.90 | 0.607 | 15 11 3.3 | 2.94 |
| 21 | 9 34 1.18 | 0.608 | 15 11 1.9 | 2.95 | 21 23 29.0 | 9 34 15.45 | 0.606 | 15 9 52.7 | 2.94 |
| 22 | 9 34 15.77 | 0.607 | 15 9 51.2 | 2.94 | 22 23 25.3 | 9 34 29.97 | 0.604 | 15 8 42.2 | 2.93 |
| 23 | 9 34 30.32 | 0.606 | 15 8 40.6 | 2.94 | 23 23 21.6 | 9 34 44.45 | 0.603 | 15 7 31.9 | 2.93 |
| 24 | 9 34 44.84 | 0.604 | 15 7 30.1 | 2.93 | 24 23 17.9 | 9 34 58.90 | 0.601 | 15 6 21.7 | 2.92 |
| 25 | 9 34 59.32 | 0.602 | 15 6 19.7 | 2.93 | 25 23 14.2 | 9 35 13.31 | 0.600 | 15 5 11.7 | 2.92 |
| 26 | 9 35 13.77 | 0.601 | 15 5 9.5 | 2.92 | 26 23 10.6 | 9 35 27.68 | 0.598 | 15 4 1.8 | 2.91 |
| 27 | 9 35 28.18 | 0.599 | 15 3 59.5 | 2.91 | 27 23 6.9 | 9 35 42.00 | 0.595 | 15 2 52.1 | 2.90 |
| 28 | 9 35 42.54 | 0.597 | 15 2 49.6 | 2.91 | 28 23 3.2 | 9 35 56.28 | 0.593 | 15 1 42.7 | 2.89 |
| 29 | 9 35 56.85 | 0.595 | 15 1 40.0 | 2.90 | 29 22 59.5 | 9 36 10.51 | 0.591 | 15 0 33.5 | 2.88 |
| 30 | 9 36 11.11 | 0.593 | 15 0 30.6 | 2.89 | 30 22 55.8 | 9 36 24.70 | 0.589 | 14 59 24.4 | 2.87 |
| 31 | 9 36 25.33 | +0.591 | +14 59 21.3 | −2.88 | 31 22 52.1 | 9 36 38.82 | +0.587 | +14 58 15.5 | −2.86 |

# URANUS, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Sept. 1 | 9 36 39.49 | +0.588 | +14 58 12.3 | −2.87 | 1 22 48.4 | 9 36 52.90 | +0.585 | +14 57 6.9 | −2.85 |
| 2 | 9 36 53.60 | 0.586 | 14 57 3.5 | 2.86 | 2 22 44.7 | 9 37 6.91 | 0.582 | 14 55 58.5 | 2.84 |
| 3 | 9 37 7.64 | 0.584 | 14 55 55.0 | 2.85 | 3 22 41.0 | 9 37 20.86 | 0.580 | 14 54 50.5 | 2.83 |
| 4 | 9 37 21.63 | 0.581 | 14 54 46.8 | 2.84 | 4 22 37.3 | 9 37 34.75 | 0.577 | 14 53 42.8 | 2.82 |
| 5 | 9 37 35.55 | 0.579 | 14 53 38.9 | 2.82 | 5 22 33.6 | 9 37 48.58 | 0.574 | 14 52 35.3 | 2.80 |
| 6 | 9 37 49.41 | 0.576 | 14 52 31.3 | 2.81 | 6 22 29.9 | 9 38 2.34 | 0.571 | 14 51 28.2 | 2.79 |
| 7 | 9 38 3.20 | 0.573 | 14 51 24.0 | 2.80 | 7 22 26.2 | 9 38 16.02 | 0.568 | 14 50 21.3 | 2.77 |
| 8 | 9 38 16.91 | 0.569 | 14 50 17.0 | 2.78 | 8 22 22.5 | 9 38 29.63 | 0.565 | 14 49 14.8 | 2.76 |
| 9 | 9 38 30.55 | 0.566 | 14 49 10.3 | 2.77 | 9 22 18.8 | 9 38 43.16 | 0.562 | 14 48 8.6 | 2.75 |
| 10 | 9 38 44.11 | 0.563 | 14 48 4.0 | 2.75 | 10 22 15.0 | 9 38 56.62 | 0.558 | 14 47 2.9 | 2.73 |
| 11 | 9 38 57.60 | 0.560 | 14 46 58.1 | 2.74 | 11 22 11.3 | 9 39 9.99 | 0.555 | 14 45 57.5 | 2.72 |
| 12 | 9 39 11.00 | 0.556 | 14 45 52.6 | 2.72 | 12 22 7.6 | 9 39 23.28 | 0.552 | 14 44 52.5 | 2.70 |
| 13 | 9 39 24.32 | 0.553 | 14 44 47.5 | 2.70 | 13 22 3.9 | 9 39 36.48 | 0.548 | 14 53 47.9 | 2.68 |
| 14 | 9 39 37.55 | 0.549 | 14 43 42.7 | 2.69 | 14 22 0.2 | 9 39 49.60 | 0.545 | 14 42 43.7 | 2.66 |
| 15 | 9 39 50.69 | 0.546 | 14 42 38.4 | 2.67 | 15 21 56.5 | 9 40 2.62 | 0.541 | 14 41 40.0 | 2.64 |
| 16 | 9 40 3.74 | 0.542 | 14 41 34.6 | 2.65 | 16 21 52.8 | 9 40 15.54 | 0.536 | 14 40 36.8 | 2.62 |
| 17 | 9 40 16.68 | 0.538 | 14 40 31.2 | 2.63 | 17 21 49.0 | 9 40 28.36 | 0.532 | 14 39 34.0 | 2.60 |
| 18 | 9 40 29.53 | 0.534 | 14 39 28.4 | 2.61 | 18 21 45.3 | 9 40 41.09 | 0.528 | 14 38 31.8 | 2.58 |
| 19 | 9 40 42.28 | 0.529 | 14 38 26.0 | 2.59 | 19 21 41.6 | 9 40 53.71 | 0.524 | 14 37 30.0 | 2.56 |
| 20 | 9 40 54.92 | 0.525 | 14 37 24.1 | 2.57 | 20 21 37.9 | 9 41 6.23 | 0.520 | 14 36 28.7 | 2.54 |
| 21 | 9 41 7.46 | 0.520 | 14 36 22.7 | 2.55 | 21 21 34.1 | 9 41 18.64 | 0.515 | 14 35 28.0 | 2.52 |
| 22 | 9 41 19.89 | 0.516 | 14 35 21.9 | 2.52 | 22 21 30.4 | 9 41 30.93 | 0.510 | 14 34 27.9 | 2.50 |
| 23 | 9 41 32.20 | 0.511 | 14 34 21.7 | 2.50 | 23 21 26.7 | 9 41 43.11 | 0.505 | 14 33 28.3 | 2.47 |
| 24 | 9 41 44.40 | 0.506 | 14 33 22.0 | 2.48 | 24 21 22.9 | 9 41 55.17 | 0.500 | 14 32 29.2 | 2.45 |
| 25 | 9 41 56.48 | 0.501 | 14 32 22.8 | 2.45 | 25 21 19.2 | 9 42 7.11 | 0.495 | 14 31 30.7 | 2.42 |
| 26 | 9 42 8.44 | 0.496 | 14 31 24.2 | 2.43 | 26 21 15.5 | 9 42 18.93 | 0.489 | 14 30 32.9 | 2.40 |
| 27 | 9 42 20.28 | 0.490 | 14 30 26.3 | 2.40 | 27 21 11.7 | 9 42 30.62 | 0.484 | 14 29 35.7 | 2.37 |
| 28 | 9 42 31.98 | 0.485 | 14 29 29.0 | 2.37 | 28 21 8.0 | 9 42 42.18 | 0.479 | 14 28 39.1 | 2.35 |
| 29 | 9 42 43.56 | 0.480 | 14 28 32.3 | 2.35 | 29 21 4.3 | 9 42 53.62 | 0.474 | 14 27 43.1 | 2.32 |
| 30 | 9 42 55.01 | 0.475 | 14 27 36.3 | 2.32 | 30 21 0.5 | 9 43 4.93 | 0.468 | 14 26 47.8 | 2.30 |
| Oct. 1 | 9 43 6.33 | 0.469 | 14 26 41.0 | 2.29 | 1 20 56.8 | 9 43 16.10 | 0.462 | 14 25 53.2 | 2.27 |
| 2 | 9 43 17.51 | 0.463 | 14 25 46.3 | 2.26 | 2 20 53.0 | 9 43 27.13 | 0.457 | 14 24 59.3 | 2.24 |
| 3 | 9 43 28.55 | 0.457 | 14 24 52.3 | 2.24 | 3 20 49.3 | 9 43 38.03 | 0.451 | 14 24 5.9 | 2.21 |
| 4 | 9 43 39.46 | 0.451 | 14 23 58.9 | 2.21 | 4 20 45.5 | 9 43 48.78 | 0.444 | 14 23 13.3 | 2.18 |
| 5 | 9 43 50.22 | 0.445 | 14 23 6.2 | 2.18 | 5 20 41.8 | 9 43 59.39 | 0.439 | 14 22 21.4 | 2.15 |
| 6 | 9 44 0.84 | 0.439 | 14 22 14.3 | 2.15 | 6 20 38.0 | 9 44 9.85 | 0.433 | 14 21 30.2 | 2.12 |
| 7 | 9 44 11.31 | 0.433 | 14 21 23.1 | 2.12 | 7 20 34.2 | 9 44 20.17 | 0.427 | 14 20 39.8 | 2.08 |
| 8 | 9 44 21.64 | 0.427 | 14 20 32.7 | 2.09 | 8 20 30.5 | 9 44 30.34 | 0.420 | 14 19 50.2 | 2.05 |
| 9 | 9 44 31.81 | 0.421 | 14 19 43.0 | 2.05 | 9 20 26.7 | 9 44 40.36 | 0.414 | 14 19 1.3 | 2.02 |
| 10 | 9 44 41.84 | 0.415 | 14 18 54.1 | 2.02 | 10 20 22.9 | 9 44 50.23 | 0.408 | 14 18 13.2 | 1.98 |
| 11 | 9 44 51.72 | 0.409 | 14 18 6.0 | 1.99 | 11 20 19.2 | 9 44 59.94 | 0.401 | 14 17 25.8 | 1.95 |
| 12 | 9 45 1.43 | 0.402 | 14 17 18.6 | 1.95 | 12 20 15.4 | 9 45 9.50 | 0.395 | 14 16 39.3 | 1.92 |
| 13 | 9 45 10.99 | 0.395 | 14 16 32.1 | 1.92 | 13 20 11.6 | 9 45 18.90 | 0.388 | 14 15 53.7 | 1.88 |
| 14 | 9 45 20.38 | 0.388 | 14 15 46.5 | 1.89 | 14 20 7.8 | 9 45 28.14 | 0.381 | 14 15 8.8 | 1.85 |
| 15 | 9 45 29.62 | 0.381 | 14 15 1.6 | 1.85 | 15 20 4.1 | 9 45 37.21 | 0.374 | 14 14 24.8 | 1.82 |
| 16 | 9 45 38.69 | 0.374 | 14 14 17.6 | 1.81 | 16 20 0.3 | 9 45 46.11 | 0.367 | 14 13 41.6 | 1.78 |
| 17 | 9 45 47.58 | 0.367 | 14 13 34.5 | 1.78 | 17 19 56.5 | 9 45 54.84 | 0.360 | 14 12 59.4 | 1.74 |
| 18 | 9 45 56.30 | 0.359 | 14 12 52.3 | 1.74 | 18 19 52.7 | 9 46 3.40 | 0.353 | 14 12 18.1 | 1.70 |
| 19 | 9 46 4.85 | 0.352 | 14 12 11.0 | 1.70 | 19 19 48.9 | 9 46 11.79 | 0.345 | 14 11 37.6 | 1.67 |
| 20 | 9 46 13.23 | 0.345 | 14 11 30.6 | 1.66 | 20 19 45.1 | 9 46 19.99 | 0.338 | 14 10 58.1 | 1.63 |
| 21 | 9 46 21.42 | 0.337 | 14 10 51.1 | 1.63 | 21 19 41.3 | 9 46 28.01 | 0.330 | 14 10 19.4 | 1.59 |
| 22 | 9 46 29.43 | 0.329 | 14 10 12.5 | 1.59 | 22 19 37.5 | 9 46 35.85 | 0.322 | 14 9 41.7 | 1.55 |
| 23 | 9 46 37.26 | 0.322 | 14 9 34.9 | 1.55 | 23 19 33.7 | 9 46 43.50 | 0.315 | 14 9 4.9 | 1.51 |
| 24 | 9 46 44.90 | 0.314 | 14 8 58.2 | 1.51 | 24 19 29.9 | 9 46 50.98 | 0.307 | 14 8 29.1 | 1.47 |
| 25 | 9 46 52.36 | 0.306 | 14 8 22.5 | 1.47 | 25 19 26.1 | 9 46 58.26 | 0.300 | 14 7 54.2 | 1.43 |
| 26 | 9 46 59.63 | 0.299 | 14 7 47.7 | 1.43 | 26 19 22.3 | 9 47 5.36 | 0.292 | 14 7 20.3 | 1.39 |
| 27 | 9 47 6.71 | 0.291 | 14 7 13.9 | 1.39 | 27 19 18.4 | 9 47 12.27 | 0.284 | 14 6 47.3 | 1.35 |
| 28 | 9 47 13.60 | 0.284 | 14 6 41.0 | 1.35 | 28 19 14.6 | 9 47 18.99 | 0.276 | 14 6 15.4 | 1.31 |
| 29 | 9 47 20.30 | 0.275 | 14 6 9.2 | 1.31 | 29 19 10.8 | 9 47 25.52 | 0.268 | 14 5 44.4 | 1.27 |
| 30 | 9 47 26.81 | 0.267 | 14 5 38.3 | 1.26 | 30 19 7.0 | 9 47 31.85 | 0.261 | 14 5 14.4 | 1.23 |
| 31 | 9 47 33.12 | 0.259 | 14 5 8.4 | 1.22 | 31 19 3.2 | 9 47 37.99 | 0.252 | 14 4 45.5 | 1.18 |
| 32 | 9 47 39.24 | +0.251 | +14 4 39.6 | −1.18 | 32 18 59.3 | 9 47 43.93 | +0.244 | +14 4 17.5 | −1.14 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Nov. 1 | 9 47 39.24 | +0.251 | +14 4 39.6 | −1.18 | 1 18 59.3 | 9 47 43.93 | +0.244 | +14 4 17.5 | −1.14 |
| 2 | 9 47 45.16 | 0.242 | 14 4 11.8 | 1.14 | 2 18 55.5 | 9 47 49.69 | 0.235 | 14 3 50.6 | 1.10 |
| 3 | 9 47 50.88 | 0.234 | 14 3 45.0 | 1.10 | 3 18 51.7 | 9 47 55.24 | 0.227 | 14 3 24.7 | 1.06 |
| 4 | 9 47 56.40 | 0.226 | 14 3 19.2 | 1.05 | 4 18 47.8 | 9 48 0.59 | 0.218 | 14 2 59.8 | 1.02 |
| 5 | 9 48 1.72 | 0.217 | 14 2 54.5 | 1.01 | 5 18 44.0 | 9 48 5.73 | 0.210 | 14 2 35.9 | 0.97 |
| 6 | 9 48 6.83 | 0.208 | 14 2 30.8 | 0.96 | 6 18 40.1 | 9 48 10.67 | 0.201 | 14 2 13.1 | 0.93 |
| 7 | 9 48 11.74 | 0.200 | 14 2 8.2 | 0.92 | 7 18 36.3 | 9 48 15.41 | 0.193 | 14 1 51.3 | 0.88 |
| 8 | 9 48 16.45 | 0.191 | 14 1 46.6 | 0.88 | 8 18 32.4 | 9 48 19.95 | 0.184 | 14 1 30.6 | 0.84 |
| 9 | 9 48 20.95 | 0.183 | 14 1 26.1 | 0.83 | 9 18 28.5 | 9 48 24.28 | 0.176 | 14 1 11.0 | 0.79 |
| 10 | 9 48 25.24 | 0.175 | 14 1 6.7 | 0.78 | 10 18 24.7 | 9 48 28.40 | 0.167 | 14 0 52.5 | 0.75 |
| 11 | 9 48 29.32 | 0.166 | 14 0 48.4 | 0.74 | 11 18 20.8 | 9 48 32.30 | 0.158 | 14 0 35.1 | 0.70 |
| 12 | 9 48 33.18 | 0.157 | 14 0 31.2 | 0.69 | 12 18 16.9 | 9 48 36.00 | 0.150 | 14 0 18.8 | 0.66 |
| 13 | 9 48 36.84 | 0.148 | 14 0 15.1 | 0.65 | 13 18 13.1 | 9 48 39.48 | 0.141 | 14 0 3.6 | 0.61 |
| 14 | 9 48 40.28 | 0.139 | 14 0 0.1 | 0.60 | 14 18 9.2 | 9 48 42.75 | 0.132 | 13 59 49.5 | 0.56 |
| 15 | 9 48 43.51 | 0.130 | 13 59 46.2 | 0.55 | 15 18 5.3 | 9 48 45.80 | 0.123 | 13 59 36.5 | 0.52 |
| 16 | 9 48 46.52 | 0.121 | 13 59 33.4 | 0.51 | 16 18 1.4 | 9 48 48.65 | 0.114 | 13 59 24.6 | 0.47 |
| 17 | 9 48 49.32 | 0.112 | 13 59 21.8 | 0.46 | 17 17 57.5 | 9 48 51.28 | 0.105 | 13 59 13.9 | 0.42 |
| 18 | 9 48 51.90 | 0.103 | 13 59 11.3 | 0.41 | 18 17 53.6 | 9 48 53.69 | 0.095 | 13 59 4.2 | 0.38 |
| 19 | 9 48 54.26 | 0.094 | 13 59 1.9 | 0.37 | 19 17 49.7 | 9 48 55.88 | 0.086 | 13 58 55.7 | 0.33 |
| 20 | 9 48 56.40 | 0.085 | 13 58 53.6 | 0.32 | 20 17 45.8 | 9 48 57.86 | 0.077 | 13 58 48.8 | 0.29 |
| 21 | 9 48 58.33 | 0.075 | 13 58 46.5 | 0.27 | 21 17 41.9 | 9 48 59.61 | 0.068 | 13 58 42.0 | 0.24 |
| 22 | 9 49 0.03 | 0.066 | 13 58 40.5 | 0.23 | 22 17 38.0 | 9 49 1.15 | 0.059 | 13 58 36.8 | 0.19 |
| 23 | 9 49 1.52 | 0.057 | 13 58 35.6 | 0.18 | 23 17 34.1 | 9 49 2.47 | 0.051 | 13 58 32.7 | 0.15 |
| 24 | 9 49 2.79 | 0.049 | 13 58 31.8 | 0.13 | 24 17 30.2 | 9 49 3.58 | 0.042 | 13 58 29.8 | 0.10 |
| 25 | 9 49 3.84 | 0.040 | 13 58 29.2 | 0.08 | 25 17 26.3 | 9 49 4.47 | 0.033 | 13 58 28.0 | −0.05 |
| 26 | 9 49 4.67 | 0.030 | 13 58 27.7 | −0.04 | 26 17 22.4 | 9 49 5.15 | 0.024 | 13 58 27.3 | 0.00 |
| 27 | 9 49 5.29 | 0.021 | 13 58 27.4 | +0.01 | 27 17 18.4 | 9 49 5.60 | 0.014 | 13 58 27.8 | +0.04 |
| 28 | 9 49 5.68 | 0.012 | 13 58 28.2 | 0.06 | 28 17 14.5 | 9 49 5.83 | +0.005 | 13 58 29.4 | 0.09 |
| 29 | 9 49 5.85 | +0.003 | 13 58 30.1 | 0.10 | 29 17 10.6 | 9 49 5.86 | −0.003 | 13 58 32.1 | 0.13 |
| 30 | 9 49 5.81 | −0.006 | 13 58 33.1 | 0.15 | 30 17 6.6 | 9 49 5.67 | 0.012 | 13 58 35.9 | 0.18 |
| Dec. 1 | 9 49 5.55 | 0.015 | 13 58 37.3 | 0.19 | 1 17 2.7 | 9 49 5.26 | 0.022 | 13 58 40.8 | 0.23 |
| 2 | 9 49 5.08 | 0.024 | 13 58 42.5 | 0.24 | 2 16 58.7 | 9 49 4.63 | 0.031 | 13 58 46.8 | 0.27 |
| 3 | 9 49 4.39 | 0.034 | 13 58 48.8 | 0.29 | 3 16 54.8 | 9 49 3.79 | 0.040 | 13 58 53.9 | 0.32 |
| 4 | 9 49 3.49 | 0.043 | 13 58 56.3 | 0.33 | 4 16 50.9 | 9 49 2.73 | 0.049 | 13 59 2.1 | 0.36 |
| 5 | 9 49 2.37 | 0.052 | 13 59 4.8 | 0.38 | 5 16 46.9 | 9 49 1.46 | 0.057 | 13 59 11.3 | 0.41 |
| 6 | 9 49 1.03 | 0.060 | 13 59 14.4 | 0.42 | 6 16 43.0 | 9 48 59.98 | 0.065 | 13 59 21.7 | 0.45 |
| 7 | 9 48 59.48 | 0.068 | 13 59 25.2 | 0.47 | 7 16 39.0 | 9 48 58.28 | 0.074 | 13 59 33.2 | 0.50 |
| 8 | 9 48 57.72 | 0.078 | 13 59 37.0 | 0.52 | 8 16 35.1 | 9 48 56.38 | 0.084 | 13 59 45.8 | 0.55 |
| 9 | 9 48 55.74 | 0.087 | 13 59 50.0 | 0.56 | 9 16 31.1 | 9 48 54.25 | 0.093 | 13 59 59.4 | 0.59 |
| 10 | 9 48 53.54 | 0.096 | 14 0 4.0 | 0.61 | 10 16 27.1 | 9 48 51.91 | 0.102 | 14 0 14.1 | 0.64 |
| 11 | 9 48 51.13 | 0.105 | 14 0 19.1 | 0.65 | 11 16 23.1 | 9 48 49.37 | 0.110 | 14 0 30.0 | 0.68 |
| 12 | 9 48 48.52 | 0.114 | 14 0 35.3 | 0.70 | 12 16 19.2 | 9 48 46.62 | 0.118 | 14 0 47.0 | 0.73 |
| 13 | 9 48 45.69 | 0.122 | 14 0 52.6 | 0.74 | 13 16 15.2 | 9 48 43.66 | 0.128 | 14 1 5.0 | 0.77 |
| 14 | 9 48 42.65 | 0.131 | 14 1 11.0 | 0.79 | 14 16 11.2 | 9 48 40.48 | 0.136 | 14 1 24.0 | 0.81 |
| 15 | 9 48 39.40 | 0.140 | 14 1 30.4 | 0.83 | 15 16 7.2 | 9 48 37.10 | 0.145 | 14 1 44.0 | 0.85 |
| 16 | 9 48 35.95 | 0.148 | 14 1 50.8 | 0.87 | 16 16 3.2 | 9 48 33.52 | 0.153 | 14 2 5.0 | 0.90 |
| 17 | 9 48 32.29 | 0.157 | 14 2 12.2 | 0.91 | 17 15 59.2 | 9 48 29.74 | 0.162 | 14 2 27.1 | 0.94 |
| 18 | 9 48 28.43 | 0.165 | 14 2 34.7 | 0.96 | 18 15 55.2 | 9 48 25.76 | 0.170 | 14 2 50.2 | 0.98 |
| 19 | 9 48 24.37 | 0.174 | 14 2 58.2 | 1.00 | 19 15 51.2 | 9 48 21.57 | 0.179 | 14 3 14.3 | 1.02 |
| 20 | 9 48 20.11 | 0.182 | 14 3 22.7 | 1.04 | 20 15 47.2 | 9 48 17.19 | 0.186 | 14 3 39.4 | 1.06 |
| 21 | 9 48 15.65 | 0.189 | 14 3 48.2 | 1.08 | 21 15 43.2 | 9 48 12.62 | 0.194 | 14 4 5.4 | 1.11 |
| 22 | 9 48 11.00 | 0.197 | 14 4 14.7 | 1.12 | 22 15 39.2 | 9 48 7.86 | 0.202 | 14 4 32.5 | 1.15 |
| 23 | 9 48 6.16 | 0.206 | 14 4 42.2 | 1.16 | 23 15 35.2 | 9 48 2.90 | 0.210 | 14 5 0.5 | 1.18 |
| 24 | 9 48 1.12 | 0.213 | 14 5 10.6 | 1.20 | 24 15 31.2 | 9 47 57.76 | 0.218 | 14 5 29.4 | 1.22 |
| 25 | 9 47 55.90 | 0.221 | 14 5 39.9 | 1.24 | 25 15 27.1 | 9 47 52.43 | 0.226 | 14 5 59.2 | 1.26 |
| 26 | 9 47 50.49 | 0.229 | 14 6 10.1 | 1.28 | 26 15 23.1 | 9 47 46.92 | 0.233 | 14 6 29.9 | 1.30 |
| 27 | 9 47 44.90 | 0.236 | 14 6 41.2 | 1.31 | 27 15 19.1 | 9 47 41.23 | 0.240 | 14 7 1.4 | 1.34 |
| 28 | 9 47 39.13 | 0.244 | 14 7 13.1 | 1.35 | 28 15 15.0 | 9 47 35.36 | 0.248 | 14 7 33.9 | 1.37 |
| 29 | 9 47 33.18 | 0.252 | 14 7 46.0 | 1.39 | 29 15 11.0 | 9 47 29.32 | 0.255 | 14 8 7.3 | 1.40 |
| 30 | 9 47 27.05 | 0.259 | 14 8 19.7 | 1.42 | 30 15 7.0 | 9 47 23.11 | 0.263 | 14 8 41.6 | 1.44 |
| 31 | 9 47 20.76 | 0.266 | 14 8 54.3 | 1.46 | 31 15 2.9 | 9 47 16.72 | 0.270 | 14 9 16.6 | 1.48 |
| 32 | 9 47 14.29 | −0.273 | +14 9 29.7 | +1.49 | 32 14 58.9 | 9 47 10.17 | −0.277 | +14 9 52.5 | +1.51 |

# NEPTUNE, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Jan. 1 | 1 55 14.79 | -0.054 | + 9 54 31.5 | -0.14 | 1 7 11.3 | 1 55 14.41 | -0.052 | + 9 54 30.5 | -0.13 |
| 2 | 1 55 13.56 | 0.048 | 9 54 28.5 | 0.11 | 2 7 7.3 | 1 55 13.22 | 0.046 | 9 54 27.7 | 0.10 |
| 3 | 1 55 12.47 | 0.043 | 9 54 26.2 | 0.08 | 3 7 3.4 | 1 55 12.17 | 0.041 | 9 54 25.6 | 0.07 |
| 4 | 1 55 11.51 | 0.037 | 9 54 24.7 | 0.05 | 4 6 59.4 | 1 55 11.25 | 0.036 | 9 54 24.3 | 0.04 |
| 5 | 1 55 10.68 | 0.032 | 9 54 23.9 | -0.02 | 5 6 55.5 | 1 55 10.46 | 0.030 | 9 54 23.8 | -0.01 |
| 6 | 1 55 9.98 | 0.026 | 9 54 23.8 | +0.01 | 6 6 51.5 | 1 55 9.80 | 0.025 | 9 54 23.9 | +0.02 |
| 7 | 1 55 9.41 | 0.021 | 9 54 24.4 | 0.04 | 7 6 47.6 | 1 55 9.27 | 0.020 | 9 54 24.7 | 0.05 |
| 8 | 1 55 8.97 | 0.016 | 9 54 25.8 | 0.07 | 8 6 43.6 | 1 55 8.86 | 0.014 | 9 54 26.3 | 0.08 |
| 9 | 1 55 8.66 | 0.010 | 9 54 27.9 | 0.10 | 9 6 39.7 | 1 55 8.59 | 0.009 | 9 54 28.6 | 0.11 |
| 10 | 1 55 8.48 | -0.005 | 9 54 30.8 | 0.13 | 10 6 35.7 | 1 55 8.45 | -0.003 | 9 54 31.7 | 0.14 |
| 11 | 1 55 8.44 | +0.001 | 9 54 34.4 | 0.16 | 11 6 31.8 | 1 55 8.44 | +0.002 | 9 54 35.5 | 0.17 |
| 12 | 1 55 8.52 | 0.006 | 9 54 38.7 | 0.20 | 12 6 27.9 | 1 55 8.56 | 0.008 | 9 54 40.0 | 0.20 |
| 13 | 1 55 8.74 | 0.012 | 9 54 43.8 | 0.23 | 13 6 24.0 | 1 55 8.82 | 0.013 | 9 54 45.2 | 0.23 |
| 14 | 1 55 9.09 | 0.017 | 9 54 49.6 | 0.26 | 14 6 20.1 | 1 55 9.20 | 0.019 | 9 54 51.1 | 0.26 |
| 15 | 1 55 9.57 | 0.023 | 9 54 56.1 | 0.29 | 15 6 16.1 | 1 55 9.71 | 0.024 | 9 54 57.8 | 0.30 |
| 16 | 1 55 10.18 | 0.028 | 9 55 3.3 | 0.32 | 16 6 12.2 | 1 55 10.36 | 0.030 | 9 55 5.3 | 0.33 |
| 17 | 1 55 10.93 | 0.034 | 9 55 11.3 | 0.35 | 17 6 8.3 | 1 55 11.14 | 0.035 | 9 55 13.5 | 0.36 |
| 18 | 1 55 11.82 | 0.040 | 9 55 20.0 | 0.38 | 18 6 4.4 | 1 55 12.06 | 0.041 | 9 55 22.4 | 0.39 |
| 19 | 1 55 12.83 | 0.045 | 9 55 29.5 | 0.41 | 19 6 0.4 | 1 55 13.10 | 0.046 | 9 55 32.0 | 0.42 |
| 20 | 1 55 13.98 | 0.051 | 9 55 39.7 | 0.44 | 20 5 56.5 | 1 55 14.28 | 0.052 | 9 55 42.3 | 0.45 |
| 21 | 1 55 15.26 | 0.056 | 9 55 50.6 | 0.47 | 21 5 52.6 | 1 55 15.59 | 0.057 | 9 55 53.3 | 0.48 |
| 22 | 1 55 16.67 | 0.062 | 9 56 2.2 | 0.50 | 22 5 48.7 | 1 55 17.03 | 0.063 | 9 56 5.1 | 0.51 |
| 23 | 1 55 18.22 | 0.067 | 9 56 14.6 | 0.53 | 23 5 44.8 | 1 55 18.60 | 0.068 | 9 56 17.6 | 0.54 |
| 24 | 1 55 19.90 | 0.072 | 9 56 27.7 | 0.56 | 24 5 40.9 | 1 55 20.31 | 0.074 | 9 56 30.8 | 0.57 |
| 25 | 1 55 21.71 | 0.078 | 9 56 41.5 | 0.59 | 25 5 37.0 | 1 55 22.15 | 0.080 | 9 56 44.8 | 0.60 |
| 26 | 1 55 23.66 | 0.084 | 9 56 56.0 | 0.62 | 26 5 33.1 | 1 55 24.13 | 0.085 | 9 56 59.5 | 0.63 |
| 27 | 1 55 25.74 | 0.089 | 9 57 11.2 | 0.65 | 27 5 29.2 | 1 55 26.23 | 0.090 | 9 57 14.8 | 0.65 |
| 28 | 1 55 27.94 | 0.095 | 9 57 27.1 | 0.68 | 28 5 25.3 | 1 55 28.46 | 0.096 | 9 57 30.8 | 0.68 |
| 29 | 1 55 30.28 | 0.100 | 9 57 43.7 | 0.71 | 29 5 21.4 | 1 55 30.82 | 0.101 | 9 57 47.5 | 0.71 |
| 30 | 1 55 32.74 | 0.106 | 9 58 1.0 | 0.74 | 30 5 17.5 | 1 55 33.31 | 0.106 | 9 58 4.9 | 0.74 |
| 31 | 1 55 35.34 | 0.111 | 9 58 19.0 | 0.76 | 31 5 13.6 | 1 55 35.92 | 0.111 | 9 58 23.0 | 0.77 |
| Feb. 1 | 1 55 38.06 | 0.116 | 9 58 37.7 | 0.79 | 1 5 9.7 | 1 55 38.66 | 0.117 | 9 58 41.8 | 0.80 |
| 2 | 1 55 40.90 | 0.121 | 9 58 57.0 | 0.82 | 2 5 5.9 | 1 55 41.43 | 0.122 | 9 59 1.2 | 0.82 |
| 3 | 1 55 43.88 | 0.127 | 9 59 17.0 | 0.85 | 3 5 2.0 | 1 55 44.52 | 0.127 | 9 59 21.3 | 0.85 |
| 4 | 1 55 46.98 | 0.132 | 9 59 37.8 | 0.88 | 4 4 58.1 | 1 55 47.63 | 0.132 | 9 59 42.1 | 0.88 |
| 5 | 1 55 50.20 | 0.137 | 9 59 59.2 | 0.90 | 5 4 54.2 | 1 55 50.87 | 0.138 | 10 0 3.6 | 0.91 |
| 6 | 1 55 53.55 | 0.142 | 10 0 21.2 | 0.93 | 6 4 50.3 | 1 55 54.24 | 0.143 | 10 0 25.7 | 0.94 |
| 7 | 1 55 57.02 | 0.147 | 10 0 43.9 | 0.96 | 7 4 46.5 | 1 55 57.73 | 0.148 | 10 0 48.5 | 0.96 |
| 8 | 1 56 0.62 | 0.152 | 10 1 7.2 | 0.99 | 8 4 42.6 | 1 56 1.34 | 0.153 | 10 1 11.9 | 0.99 |
| 9 | 1 56 4.34 | 0.157 | 10 1 31.2 | 1.01 | 9 4 38.7 | 1 56 5.07 | 0.158 | 10 1 35.9 | 1.01 |
| 10 | 1 56 8.17 | 0.162 | 10 1 55.8 | 1.04 | 10 4 34.9 | 1 56 8.91 | 0.163 | 10 2 0.6 | 1.04 |
| 11 | 1 56 12.13 | 0.167 | 10 2 21.0 | 1.06 | 11 4 31.0 | 1 56 12.89 | 0.168 | 10 2 25.9 | 1.07 |
| 12 | 1 56 16.21 | 0.172 | 10 2 46.9 | 1.09 | 12 4 27.1 | 1 56 16.98 | 0.173 | 10 2 51.8 | 1.09 |
| 13 | 1 56 20.40 | 0.177 | 10 3 13.3 | 1.11 | 13 4 23.3 | 1 56 21.18 | 0.177 | 10 3 18.2 | 1.11 |
| 14 | 1 56 24.70 | 0.182 | 10 3 40.3 | 1.14 | 14 4 19.4 | 1 56 25.49 | 0.182 | 10 3 45.2 | 1.14 |
| 15 | 1 56 29.12 | 0.187 | 10 4 7.9 | 1.16 | 15 4 15.6 | 1 56 29.92 | 0.187 | 10 4 12.9 | 1.16 |
| 16 | 1 56 33.66 | 0.191 | 10 4 36.1 | 1.19 | 16 4 11.7 | 1 56 34.46 | 0.192 | 10 4 41.1 | 1.19 |
| 17 | 1 56 38.31 | 0.196 | 10 5 4.9 | 1.21 | 17 4 7.9 | 1 56 39.12 | 0.196 | 10 5 9.9 | 1.21 |
| 18 | 1 56 43.07 | 0.201 | 10 5 34.3 | 1.24 | 18 4 4.0 | 1 56 43.89 | 0.201 | 10 5 39.3 | 1.24 |
| 19 | 1 56 47.95 | 0.206 | 10 6 4.2 | 1.26 | 19 4 0.1 | 1 56 48.78 | 0.206 | 10 6 9.3 | 1.26 |
| 20 | 1 56 52.94 | 0.210 | 10 6 34.7 | 1.28 | 20 3 56.3 | 1 56 53.77 | 0.210 | 10 6 39.8 | 1.28 |
| 21 | 1 56 58.03 | 0.214 | 10 7 5.8 | 1.31 | 21 3 52.4 | 1 56 58.86 | 0.214 | 10 7 10.9 | 1.31 |
| 22 | 1 57 3.23 | 0.219 | 10 7 37.4 | 1.33 | 22 3 48.6 | 1 57 4.06 | 0.219 | 10 7 42.5 | 1.33 |
| 23 | 1 57 8.53 | 0.223 | 10 8 9.5 | 1.35 | 23 3 44.8 | 1 57 9.37 | 0.223 | 10 8 14.6 | 1.35 |
| 24 | 1 57 13.94 | 0.228 | 10 8 42.2 | 1.37 | 24 3 40.9 | 1 57 14.78 | 0.228 | 10 8 47.2 | 1.37 |
| 25 | 1 57 19.46 | 0.232 | 10 9 15.4 | 1.39 | 25 3 37.1 | 1 57 20.30 | 0.232 | 10 9 20.4 | 1.39 |
| 26 | 1 57 25.08 | 0.236 | 10 9 49.1 | 1.41 | 26 3 33.2 | 1 57 25.92 | 0.236 | 10 9 54.1 | 1.41 |
| 27 | 1 57 30.79 | 0.240 | 10 10 23.3 | 1.44 | 27 3 29.4 | 1 57 31.63 | 0.240 | 10 10 28.3 | 1.44 |
| 28 | 1 57 36.60 | 0.244 | 10 10 58.0 | 1.46 | 28 3 25.6 | 1 57 37.44 | 0.244 | 10 11 3.0 | 1.46 |
| 29 | 1 57 42.52 | 0.249 | 10 11 33.2 | 1.48 | 29 3 21.7 | 1 57 43.35 | 0.248 | 10 11 38.2 | 1.48 |
| 30 | 1 57 48.53 | +0.253 | +10 12 8.9 | +1.50 | 30 3 17.9 | 1 57 49.36 | +0.252 | +10 12 13.8 | +1.50 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Mar. 1 | 1 57 48.53 | +0.253 | +10 12 8.9 | +1.50 | 1 3 17.9 | 1 57 49.36 | +0.252 | +10 12 13.8 | +1.50 |
| 2 | 1 57 54.64 | 0.256 | 10 12 45.0 | 1.51 | 2 3 14.1 | 1 57 55.47 | 0.256 | 10 12 49.9 | 1.51 |
| 3 | 1 58 0.84 | 0.260 | 10 13 21.5 | 1.53 | 3 3 10.2 | 1 58 1.67 | 0.260 | 10 13 26.4 | 1.53 |
| 4 | 1 58 7.13 | 0.264 | 10 13 58.5 | 1.55 | 4 3 6.4 | 1 58 7.96 | 0.264 | 10 14 3.3 | 1.55 |
| 5 | 1 58 13.51 | 0.268 | 10 14 36.0 | 1.57 | 5 3 2.6 | 1 58 14.33 | 0.267 | 10 14 40.7 | 1.57 |
| 6 | 1 58 19.98 | 0.271 | 10 15 13.9 | 1.59 | 6 2 58.8 | 1 58 20.79 | 0.271 | 10 15 18.5 | 1.58 |
| 7 | 1 58 26.54 | 0.275 | 10 15 52.1 | 1.60 | 7 2 54.9 | 1 58 27.34 | 0.275 | 10 15 56.7 | 1.60 |
| 8 | 1 58 33.18 | 0.278 | 10 16 30.7 | 1.62 | 8 2 51.1 | 1 58 33.97 | 0.278 | 10 16 35.3 | 1.62 |
| 9 | 1 58 39.90 | 0.282 | 10 17 9.8 | 1.64 | 9 2 47.3 | 1 58 40.69 | 0.282 | 10 17 14.3 | 1.63 |
| 10 | 1 58 46.71 | 0.285 | 10 17 49.2 | 1.65 | 10 2 43.5 | 1 58 47.49 | 0.285 | 10 17 53.7 | 1.65 |
| 11 | 1 58 53.60 | 0.289 | 10 18 29.0 | 1.67 | 11 2 39.7 | 1 58 54.37 | 0.288 | 10 18 33.5 | 1.66 |
| 12 | 1 59 0.56 | 0.292 | 10 19 9.2 | 1.68 | 12 2 35.9 | 1 59 1.32 | 0.291 | 10 19 13.6 | 1.68 |
| 13 | 1 59 7.60 | 0.295 | 10 19 49.7 | 1.70 | 13 2 32.0 | 1 59 8.35 | 0.295 | 10 19 54.0 | 1.69 |
| 14 | 1 59 14.72 | 0.298 | 10 20 30.6 | 1.71 | 14 2 28.2 | 1 59 15.46 | 0.298 | 10 20 34.8 | 1.71 |
| 15 | 1 59 21.91 | 0.301 | 10 21 11.8 | 1.72 | 15 2 24.4 | 1 59 22.64 | 0.301 | 10 21 15.9 | 1.72 |
| 16 | 1 59 29.17 | 0.304 | 10 21 53.4 | 1.74 | 16 2 20.6 | 1 59 29.88 | 0.304 | 10 21 57.4 | 1.74 |
| 17 | 1 59 36.51 | 0.307 | 10 22 35.2 | 1.75 | 17 2 16.8 | 1 59 37.21 | 0.307 | 10 22 39.2 | 1.75 |
| 18 | 1 59 43.91 | 0.310 | 10 23 17.4 | 1.76 | 18 2 13.0 | 1 59 44.60 | 0.309 | 10 23 21.3 | 1.76 |
| 19 | 1 59 51.37 | 0.312 | 10 23 59.8 | 1.77 | 19 2 9.2 | 1 59 52.05 | 0.312 | 10 24 3.6 | 1.77 |
| 20 | 1 59 58.91 | 0.315 | 10 24 42.6 | 1.79 | 20 2 5.4 | 1 59 59.57 | 0.315 | 10 24 46.3 | 1.79 |
| 21 | 2 0 6.51 | 0.318 | 10 25 25.7 | 1.80 | 21 2 1.6 | 2 0 7.16 | 0.317 | 10 25 29.3 | 1.80 |
| 22 | 2 0 14.17 | 0.320 | 10 26 9.0 | 1.81 | 22 1 57.8 | 2 0 14.80 | 0.320 | 10 26 12.6 | 1.81 |
| 23 | 2 0 21.89 | 0.323 | 10 26 52.6 | 1.82 | 23 1 54.0 | 2 0 22.50 | 0.322 | 10 26 56.1 | 1.82 |
| 24 | 2 0 29.67 | 0.325 | 10 27 36.4 | 1.83 | 24 1 50.2 | 2 0 30.27 | 0.325 | 10 27 39.8 | 1.83 |
| 25 | 2 0 37.51 | 0.328 | 10 28 20.4 | 1.84 | 25 1 46.4 | 2 0 38.09 | 0.327 | 10 28 23.7 | 1.83 |
| 26 | 2 0 45.40 | 0.330 | 10 29 4.6 | 1.85 | 26 1 42.6 | 2 0 45.97 | 0.329 | 10 29 7.8 | 1.84 |
| 27 | 2 0 53.35 | 0.332 | 10 29 49.1 | 1.86 | 27 1 38.8 | 2 0 53.90 | 0.331 | 10 29 52.2 | 1.85 |
| 28 | 2 1 1.35 | 0.334 | 10 30 33.8 | 1.87 | 28 1 35.0 | 2 1 1.88 | 0.333 | 10 30 36.8 | 1.86 |
| 29 | 2 1 9.39 | 0.336 | 10 31 18.7 | 1.87 | 29 1 31.1 | 2 1 9.90 | 0.335 | 10 31 21.5 | 1.87 |
| 30 | 2 1 17.48 | 0.338 | 10 32 3.7 | 1.88 | 30 1 27.4 | 2 1 17.97 | 0.337 | 10 32 6.4 | 1.88 |
| 31 | 2 1 25.62 | 0.340 | 10 32 48.9 | 1.89 | 31 1 23.6 | 2 1 26.09 | 0.339 | 10 32 51.5 | 1.88 |
| Apr. 1 | 2 1 33.80 | 0.342 | 10 33 34.2 | 1.89 | 1 1 19.8 | 2 1 34.25 | 0.341 | 10 33 36.7 | 1.89 |
| 2 | 2 1 42.02 | 0.343 | 10 34 19.7 | 1.90 | 2 1 16.0 | 2 1 42.46 | 0.343 | 10 34 22.1 | 1.89 |
| 3 | 2 1 50.28 | 0.345 | 10 35 5.3 | 1.90 | 3 1 12.2 | 2 1 50.70 | 0.344 | 10 35 7.6 | 1.90 |
| 4 | 2 1 58.58 | 0.347 | 10 35 51.1 | 1.91 | 4 1 8.4 | 2 1 58.98 | 0.346 | 10 35 53.3 | 1.91 |
| 5 | 2 2 6.92 | 0.348 | 10 36 37.0 | 1.91 | 5 1 4.6 | 2 2 7.30 | 0.347 | 10 36 39.1 | 1.91 |
| 6 | 2 2 15.29 | 0.349 | 10 37 23.0 | 1.92 | 6 1 0.8 | 2 2 15.65 | 0.348 | 10 37 25.0 | 1.91 |
| 7 | 2 2 23.68 | 0.350 | 10 38 9.0 | 1.92 | 7 0 57.0 | 2 2 24.01 | 0.350 | 10 38 10.9 | 1.91 |
| 8 | 2 2 32.11 | 0.352 | 10 38 55.1 | 1.92 | 8 0 53.2 | 2 2 32.42 | 0.351 | 10 38 56.9 | 1.92 |
| 9 | 2 2 40.57 | 0.353 | 10 39 41.4 | 1.93 | 9 0 49.4 | 2 2 40.86 | 0.352 | 10 39 43.0 | 1.92 |
| 10 | 2 2 49.05 | 0.354 | 10 40 27.7 | 1.93 | 10 0 45.6 | 2 2 49.32 | 0.353 | 10 40 29.2 | 1.92 |
| 11 | 2 2 57.56 | 0.355 | 10 41 14.0 | 1.93 | 11 0 41.8 | 2 2 57.81 | 0.354 | 10 41 15.4 | 1.92 |
| 12 | 2 3 6.09 | 0.356 | 10 42 0.3 | 1.93 | 12 0 38.0 | 2 3 6.31 | 0.355 | 10 42 1.6 | 1.92 |
| 13 | 2 3 14.64 | 0.357 | 10 42 46.7 | 1.94 | 13 0 34.3 | 2 3 14.84 | 0.356 | 10 42 47.8 | 1.93 |
| 14 | 2 3 23.21 | 0.358 | 10 43 33.2 | 1.94 | 14 0 30.5 | 2 3 23.39 | 0.357 | 10 43 34.1 | 1.93 |
| 15 | 2 3 31.80 | 0.358 | 10 44 19.6 | 1.94 | 15 0 26.7 | 2 3 31.96 | 0.357 | 10 44 20.5 | 1.93 |
| 16 | 2 3 40.40 | 0.359 | 10 45 6.1 | 1.94 | 16 0 22.9 | 2 3 40.54 | 0.358 | 10 45 6.8 | 1.93 |
| 17 | 2 3 49.02 | 0.359 | 10 45 52.5 | 1.94 | 17 0 19.1 | 2 3 49.13 | 0.358 | 10 45 53.1 | 1.93 |
| 18 | 2 3 57.65 | 0.360 | 10 46 39.0 | 1.94 | 18 0 15.3 | 2 3 57.74 | 0.359 | 10 46 39.5 | 1.93 |
| 19 | 2 4 6.30 | 0.360 | 10 47 25.4 | 1.93 | 19 0 11.5 | 2 4 6.37 | 0.360 | 10 47 25.8 | 1.93 |
| 20 | 2 4 14.95 | 0.361 | 10 48 11.8 | 1.93 | 20 0 7.7 | 2 4 15.00 | 0.360 | 10 48 12.0 | 1.92 |
| 21 | 2 4 23.61 | 0.361 | 10 48 58.1 | 1.93 | 21 0 4.0 | 2 4 23.63 | 0.360 | 10 48 58.2 | 1.92 |
| 22 | 2 4 32.27 | 0.361 | 10 49 44.3 | 1.93 | 22 0 0.2 | 2 4 32.27 | 0.360 | 10 49 44.3 | 1.92 |
| | | | | | 22 23 56.4 | 2 4 40.91 | 0.360 | 10 50 30.4 | 1.92 |
| 23 | 2 4 40.93 | 0.361 | 10 50 30.5 | 1.92 | 23 23 52.6 | 2 4 49.56 | 0.360 | 10 51 16.4 | 1.91 |
| 24 | 2 4 49.60 | 0.361 | 10 51 16.7 | 1.92 | 24 23 48.8 | 2 4 58.19 | 0.360 | 10 52 2.3 | 1.91 |
| 25 | 2 4 58.26 | 0.361 | 10 52 2.8 | 1.92 | 25 23 45.0 | 2 5 6.83 | 0.360 | 10 52 48.1 | 1.91 |
| 26 | 2 5 6.92 | 0.361 | 10 52 48.7 | 1.91 | 26 23 41.2 | 2 5 15.45 | 0.359 | 10 53 33.8 | 1.90 |
| 27 | 2 5 15.57 | 0.360 | 10 53 34.5 | 1.91 | 27 23 37.4 | 2 5 24.07 | 0.359 | 10 54 19.4 | 1.90 |
| 28 | 2 5 24.21 | 0.360 | 10 54 20.2 | 1.90 | 28 23 33.6 | 2 5 32.69 | 0.359 | 10 55 4.9 | 1.89 |
| 29 | 2 5 32.85 | 0.360 | 10 55 5.7 | 1.89 | 29 23 29.8 | 2 5 41.29 | 0.358 | 10 55 50.2 | 1.88 |
| 30 | 2 5 41.47 | +0.359 | +10 55 51.1 | +1.89 | 30 23 26.1 | 2 5 49.88 | +0.358 | +10 56 35.3 | +1.88 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| May 1 | 2 5 50.08 | +0.359 | +10 56 36.4 | +1.88 | 1 23 22.3 | 2 5 58.45 | +0.357 | +10 57 20.3 | +1.87 |
| 2 | 2 5 58.68 | 0.358 | 10 57 21.5 | 1.87 | 2 23 18.5 | 2 6 7.01 | 0.356 | 10 58 5.1 | 1.86 |
| 3 | 2 6 7.26 | 0.357 | 10 58 6.4 | 1.87 | 3 23 14.7 | 2 6 15.55 | 0.355 | 10 58 49.8 | 1.86 |
| 4 | 2 6 15.82 | 0.356 | 10 58 51.2 | 1.86 | 4 23 10.9 | 2 6 24.07 | 0.354 | 10 59 34.3 | 1.85 |
| 5 | 2 6 24.36 | 0.355 | 10 59 35.8 | 1.85 | 5 23 7.1 | 2 6 32.56 | 0.353 | 11 0 18.6 | 1.84 |
| 6 | 2 6 32.87 | 0.354 | 11 0 20.2 | 1.84 | 6 23 3.3 | 2 6 41.02 | 0.352 | 11 1 2.6 | 1.83 |
| 7 | 2 6 41.36 | 0.353 | 11 1 4.3 | 1.83 | 7 22 59.5 | 2 6 49.47 | 0.351 | 11 1 46.4 | 1.82 |
| 8 | 2 6 49.83 | 0.352 | 11 1 48.2 | 1.82 | 8 22 55.7 | 2 6 57.89 | 0.350 | 11 2 30.0 | 1.81 |
| 9 | 2 6 58.27 | 0.351 | 11 2 31.9 | 1.82 | 9 22 52.0 | 2 7 6.28 | 0.349 | 11 3 13.3 | 1.80 |
| 10 | 2 7 6.68 | 0.350 | 11 3 15.4 | 1.81 | 10 22 48.2 | 2 7 14.64 | 0.348 | 11 3 56.4 | 1.79 |
| 11 | 2 7 15.06 | 0.349 | 11 3 58.7 | 1.80 | 11 22 44.4 | 2 7 22.97 | 0.346 | 11 4 39.3 | 1.78 |
| 12 | 2 7 23.41 | 0.347 | 11 4 41.7 | 1.79 | 12 22 40.6 | 2 7 31.26 | 0.345 | 11 5 22.0 | 1.77 |
| 13 | 2 7 31.72 | 0.345 | 11 5 24.4 | 1.78 | 13 22 36.8 | 2 7 39.51 | 0.343 | 11 6 4.4 | 1.76 |
| 14 | 2 7 39.99 | 0.344 | 11 6 6.9 | 1.77 | 14 22 33.0 | 2 7 47.73 | 0.342 | 11 6 46.6 | 1.75 |
| 15 | 2 7 48.23 | 0.342 | 11 6 49.1 | 1.75 | 15 22 29.2 | 2 7 55.91 | 0.340 | 11 7 28.4 | 1.74 |
| 16 | 2 7 56.43 | 0.341 | 11 7 31.0 | 1.74 | 16 22 25.4 | 2 8 4.05 | 0.338 | 11 8 9.9 | 1.72 |
| 17 | 2 8 4.59 | 0.339 | 11 8 12.7 | 1.73 | 17 22 21.6 | 2 8 12.15 | 0.336 | 11 8 51.1 | 1.71 |
| 18 | 2 8 12.70 | 0.337 | 11 8 54.0 | 1.72 | 18 22 17.8 | 2 8 20.20 | 0.334 | 11 9 32.1 | 1.70 |
| 19 | 2 8 20.77 | 0.335 | 11 9 35.0 | 1.70 | 19 22 14.0 | 2 8 28.20 | 0.332 | 11 10 12.7 | 1.69 |
| 20 | 2 8 28.79 | 0.333 | 11 10 15.7 | 1.69 | 20 22 10.2 | 2 8 36.15 | 0.330 | 11 10 53.0 | 1.67 |
| 21 | 2 8 36.76 | 0.331 | 11 10 56.1 | 1.68 | 21 22 6.4 | 2 8 44.05 | 0.328 | 11 11 32.9 | 1.66 |
| 22 | 2 8 44.68 | 0.329 | 11 11 36.1 | 1.66 | 22 22 2.7 | 2 8 51.91 | 0.326 | 11 12 12.5 | 1.64 |
| 23 | 2 8 52.55 | 0.327 | 11 12 15.8 | 1.65 | 23 21 58.8 | 2 8 59.71 | 0.324 | 11 12 51.8 | 1.63 |
| 24 | 2 9 0.37 | 0.325 | 11 12 55.1 | 1.63 | 24 21 55.0 | 2 9 7.46 | 0.322 | 11 13 30.7 | 1.61 |
| 25 | 2 9 8.13 | 0.322 | 11 13 34.1 | 1.62 | 25 21 51.2 | 2 9 15.15 | 0.319 | 11 14 9.2 | 1.60 |
| 26 | 2 9 15.84 | 0.320 | 11 14 12.7 | 1.60 | 26 21 47.4 | 2 9 22.78 | 0.317 | 11 14 47.3 | 1.58 |
| 27 | 2 9 23.48 | 0.317 | 11 14 50.8 | 1.58 | 27 21 43.6 | 2 9 30.35 | 0.314 | 11 15 25.0 | 1.56 |
| 28 | 2 9 31.06 | 0.315 | 11 15 28.6 | 1.57 | 28 21 39.8 | 2 9 37.86 | 0.311 | 11 16 2.4 | 1.55 |
| 29 | 2 9 38.59 | 0.312 | 11 16 6.0 | 1.55 | 29 21 36.0 | 2 9 45.30 | 0.309 | 11 16 39.3 | 1.53 |
| 30 | 2 9 46.05 | 0.309 | 11 16 43.0 | 1.53 | 30 21 32.2 | 2 9 52.68 | 0.306 | 11 17 15.8 | 1.51 |
| 31 | 2 9 53.44 | 0.306 | 11 17 19.6 | 1.51 | 31 21 28.4 | 2 9 59.99 | 0.303 | 11 17 51.9 | 1.50 |
| June 1 | 2 10 0.76 | 0.304 | 11 17 55.7 | 1.50 | 1 21 24.5 | 2 10 7.23 | 0.300 | 11 18 27.6 | 1.48 |
| 2 | 2 10 8.01 | 0.301 | 11 18 31.5 | 1.48 | 2 21 20.7 | 2 10 14.40 | 0.297 | 11 19 2.9 | 1.46 |
| 3 | 2 10 15.19 | 0.298 | 11 19 6.9 | 1.46 | 3 21 16.9 | 2 10 21.50 | 0.294 | 11 19 37.8 | 1.45 |
| 4 | 2 10 22.30 | 0.295 | 11 19 41.8 | 1.45 | 4 21 13.1 | 2 10 28.53 | 0.291 | 11 20 12.3 | 1.43 |
| 5 | 2 10 29.34 | 0.292 | 11 20 16.3 | 1.43 | 5 21 9.3 | 2 10 35.48 | 0.288 | 11 20 46.3 | 1.41 |
| 6 | 2 10 36.30 | 0.289 | 11 20 50.3 | 1.41 | 6 21 5.5 | 2 10 42.36 | 0.285 | 11 21 19.8 | 1.39 |
| 7 | 2 10 43.19 | 0.286 | 11 21 23.8 | 1.39 | 7 21 1.6 | 2 10 49.17 | 0.282 | 11 21 52.8 | 1.37 |
| 8 | 2 10 50.01 | 0.283 | 11 21 56.9 | 1.37 | 8 20 57.8 | 2 10 55.90 | 0.279 | 11 22 25.4 | 1.35 |
| 9 | 2 10 56.75 | 0.279 | 11 22 29.5 | 1.35 | 9 20 54.0 | 2 11 2.55 | 0.275 | 11 22 57.6 | 1.33 |
| 10 | 2 11 3.40 | 0.275 | 11 23 1.7 | 1.33 | 10 20 50.2 | 2 11 9.11 | 0.272 | 11 23 29.2 | 1.31 |
| 11 | 2 11 9.97 | 0.272 | 11 23 33.4 | 1.31 | 11 20 46.4 | 2 11 15.59 | 0.268 | 11 24 0.3 | 1.29 |
| 12 | 2 11 16.46 | 0.269 | 11 24 4.5 | 1.29 | 12 20 42.5 | 2 11 21.99 | 0.265 | 11 24 30.9 | 1.27 |
| 13 | 2 11 22.86 | 0.265 | 11 24 35.1 | 1.27 | 13 20 38.7 | 2 11 28.30 | 0.261 | 11 25 1.0 | 1.25 |
| 14 | 2 11 29.18 | 0.261 | 11 25 5.2 | 1.25 | 14 20 34.9 | 2 11 34.52 | 0.257 | 11 25 30.7 | 1.23 |
| 15 | 2 11 35.41 | 0.258 | 11 25 34.9 | 1.23 | 15 20 31.0 | 2 11 40.66 | 0.254 | 11 25 59.9 | 1.20 |
| 16 | 2 11 41.55 | 0.254 | 11 26 4.1 | 1.20 | 16 20 27.2 | 2 11 46.71 | 0.250 | 11 26 28.5 | 1.18 |
| 17 | 2 11 47.60 | 0.250 | 11 26 32.7 | 1.18 | 17 20 23.4 | 2 11 52.67 | 0.246 | 11 26 56.5 | 1.16 |
| 18 | 2 11 53.56 | 0.246 | 11 27 0.7 | 1.16 | 18 20 19.5 | 2 11 58.54 | 0.242 | 11 27 24.0 | 1.14 |
| 19 | 2 11 59.43 | 0.242 | 11 27 28.2 | 1.14 | 19 20 15.7 | 2 12 4.31 | 0.238 | 11 27 51.0 | 1.11 |
| 20 | 2 12 5.20 | 0.238 | 11 27 55.2 | 1.11 | 20 20 11.9 | 2 12 9.98 | 0.234 | 11 28 17.5 | 1.09 |
| 21 | 2 12 10.88 | 0.234 | 11 28 21.7 | 1.09 | 21 20 8.0 | 2 12 15.56 | 0.230 | 11 28 43.4 | 1.07 |
| 22 | 2 12 16.45 | 0.230 | 11 28 47.6 | 1.07 | 22 20 4.2 | 2 12 21.04 | 0.226 | 11 29 8.8 | 1.05 |
| 23 | 2 12 21.93 | 0.226 | 11 29 13.0 | 1.05 | 23 20 0.3 | 2 12 26.42 | 0.222 | 11 29 33.6 | 1.02 |
| 24 | 2 12 27.31 | 0.222 | 11 29 37.8 | 1.02 | 24 19 56.5 | 2 12 31.70 | 0.218 | 11 29 57.9 | 1.00 |
| 25 | 2 12 32.59 | 0.218 | 11 30 2.0 | 1.00 | 25 19 52.7 | 2 12 36.89 | 0.214 | 11 30 21.6 | 0.98 |
| 26 | 2 12 37.77 | 0.214 | 11 30 25.6 | 0.97 | 26 19 48.8 | 2 12 41.97 | 0.209 | 11 30 44.7 | 0.95 |
| 27 | 2 12 42.85 | 0.209 | 11 30 48.7 | 0.95 | 27 19 45.0 | 2 12 46.94 | 0.205 | 11 31 7.3 | 0.93 |
| 28 | 2 12 47.82 | 0.205 | 11 31 11.2 | 0.92 | 28 19 41.1 | 2 12 51.81 | 0.201 | 11 31 29.2 | 0.90 |
| 29 | 2 12 52.68 | 0.200 | 11 31 33.1 | 0.90 | 29 19 37.3 | 2 12 56.58 | 0.196 | 11 31 50.5 | 0.88 |
| 30 | 2 12 57.44 | 0.196 | 11 31 54.4 | 0.88 | 30 19 33.4 | 2 13 1.24 | 0.192 | 11 32 11.3 | 0.86 |
| 31 | 2 13 2.09 | +0.191 | +11 32 15.1 | +0.85 | 31 19 29.5 | 2 13 5.79 | +0.187 | +11 32 31.5 | +0.83 |

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| July 1 | 2 13 2.09 | +0.191 | +11 32 15.1 | +0.85 | 1 19 29.5 | 2 13 5.79 | +0.187 | +11 32 31.5 | +0.83 |
| 2 | 2 13 6.63 | 0.187 | 11 32 35.2 | 0.82 | 2 19 25.7 | 2 13 10.23 | 0.183 | 11 32 51.0 | 0.80 |
| 3 | 2 13 11.07 | 0.183 | 11 32 54.7 | 0.80 | 3 19 21.8 | 2 13 14.57 | 0.178 | 11 33 10.0 | 0.78 |
| 4 | 2 13 15.40 | 0.178 | 11 33 13.6 | 0.77 | 4 19 18.0 | 2 13 18.79 | 0.174 | 11 33 28.4 | 0.75 |
| 5 | 2 13 19.61 | 0.173 | 11 33 31.9 | 0.75 | 5 19 14.1 | 2 13 22.90 | 0.169 | 11 33 46.2 | 0.73 |
| 6 | 2 13 23.71 | 0.169 | 11 33 49.6 | 0.72 | 6 19 10.2 | 2 13 26.90 | 0.164 | 11 34 3.3 | 0.70 |
| 7 | 2 13 27.70 | 0.164 | 11 34 6.7 | 0.70 | 7 19 6.4 | 2 13 30.79 | 0.160 | 11 34 19.9 | 0.68 |
| 8 | 2 13 31.57 | 0.159 | 11 34 23.2 | 0.67 | 8 19 2.5 | 2 13 34.56 | 0.155 | 11 34 35.9 | 0.65 |
| 9 | 2 13 35.33 | 0.154 | 11 34 39.1 | 0.65 | 9 18 58.6 | 2 13 38.22 | 0.150 | 11 34 51.2 | 0.62 |
| 10 | 2 13 38.98 | 0.150 | 11 34 54.3 | 0.62 | 10 18 54.7 | 2 13 41.77 | 0.145 | 11 35 5.8 | 0.60 |
| 11 | 2 13 42.51 | 0.145 | 11 35 8.9 | 0.60 | 11 18 50.9 | 2 13 45.20 | 0.140 | 11 35 19 9 | 0.57 |
| 12 | 2 13 45.92 | 0.140 | 11 35 22.9 | 0.57 | 12 18 47.0 | 2 13 48.51 | 0.136 | 11 35 33.4 | 0.55 |
| 13 | 2 13 49.22 | 0.135 | 11 35 36.2 | 0.54 | 13 18 43.1 | 2 13 51.71 | 0.131 | 11 35 46.2 | 0.52 |
| 14 | 2 13 52.40 | 0.130 | 11 35 48.9 | 0.52 | 14 18 39.2 | 2 13 54.79 | 0.126 | 11 35 58.4 | 0.49 |
| 15 | 2 13 55.46 | 0.125 | 11 36 1.0 | 0.49 | 15 18 35.4 | 2 13 57.74 | 0.120 | 11 36 9.9 | 0.47 |
| 16 | 2 13 58.39 | 0.120 | 11 36 12.4 | 0.46 | 16 18 31.5 | 2 14 0.57 | 0.115 | 11 36 20.8 | 0.44 |
| 17 | 2 14 1.20 | 0.115 | 11 36 23.2 | 0.44 | 17 18 27.6 | 2 14 3.29 | 0.110 | 11 36 31.1 | 0.41 |
| 18 | 2 14 3.90 | 0.110 | 11 36 33.4 | 0.41 | 18 18 23.7 | 2 14 5.88 | 0.105 | 11 36 40.7 | 0.39 |
| 19 | 2 14 6 47 | 0.105 | 11 36 42.9 | 0.38 | 19 18 19.8 | 2 14 8.35 | 0.100 | 11 36 49.7 | 0.36 |
| 20 | 2 14 8.92 | 0.100 | 11 36 51.7 | 0.35 | 20 18 15.9 | 2 14 10.70 | 0.095 | 11 36 58.0 | 0.33 |
| 21 | 2 14 11.25 | 0.094 | 11 36 59.9 | 0.33 | 21 18 12.0 | 2 14 12.93 | 0.090 | 11 37 5.6 | 0.30 |
| 22 | 2 14 13.45 | 0.089 | 11 37 7.4 | 0.30 | 22 18 8.1 | 2 14 15.03 | 0.085 | 11 37 12.6 | 0.28 |
| 23 | 2 14 15.52 | 0.084 | 11 37 14.3 | 0.27 | 23 18 4.2 | 2 14 17.00 | 0.080 | 11 37 19.0 | 0.25 |
| 24 | 2 14 17.47 | 0.079 | 11 37 20.5 | 0.25 | 24 18 0.3 | 2 14 18.85 | 0.075 | 11 37 24.7 | 0.22 |
| 25 | 2 14 19.30 | 0.074 | 11 37 26.1 | 0.22 | 25 17 56.4 | 2 14 20.58 | 0.069 | 11 37 29.8 | 0.20 |
| 26 | 2 14 21.00 | 0.068 | 11 37 31.0 | 0.19 | 26 17 52.5 | 2 14 22.18 | 0.064 | 11 37 34.2 | 0.17 |
| 27 | 2 14 22.57 | 0.063 | 11 37 35.2 | 0.16 | 27 17 48.6 | 2 14 23.66 | 0.059 | 11 37 37.9 | 0.14 |
| 28 | 2 14 24.02 | 0.058 | 11 37 38.8 | 0.14 | 28 17 44.7 | 2 14 25.01 | 0.054 | 11 37 41.0 | 0.12 |
| 29 | 2 14 25.34 | 0.052 | 11 37 41.7 | 0.11 | 29 17 40.8 | 2 14 26.23 | 0.048 | 11 37 43.5 | 0.09 |
| 30 | 2 14 26.53 | 0.047 | 11 37 44.0 | 0.08 | 30 17 36.9 | 2 14 27.33 | 0.043 | 11 37 45.3 | 0.06 |
| 31 | 2 14 27.60 | 0.042 | 11 37 45.6 | 0.06 | 31 17 33.0 | 2 14 28.30 | 0.038 | 11 37 46.4 | 0.03 |
| Aug. 1 | 2 14 28.54 | 0.037 | 11 37 46.6 | +0.03 | 1 17 29.0 | 2 14 29.15 | 0.033 | 11 37 46.9 | +0.01 |
| 2 | 2 14 29.36 | 0.031 | 11 37 46 9 | 0.00 | 2 17 25.1 | 2 14 29.87 | 0.028 | 11 37 46.8 | -0 02 |
| 3 | 2 14 30.05 | 0.026 | 11 37 46.6 | -0.03 | 3 17 21.2 | 2 14 30.47 | 0.022 | 11 37 46.0 | 0.05 |
| 4 | 2 14 30.61 | 0.021 | 11 37 45.6 | 0.06 | 4 17 17.3 | 2 14 30.94 | 0.017 | 11 37 44.5 | 0.07 |
| 5 | 2 14 31.05 | 0.016 | 11 37 43.9 | 0.08 | 5 17 13.3 | 2 14 31.28 | 0.012 | 11 37 42.4 | 0.10 |
| 6 | 2 14 31.36 | 0.010 | 11 37 41.6 | 0.11 | 6 17 9.4 | 2 14 31.50 | 0.007 | 11 37 39.6 | 0.13 |
| 7 | 2 14 31.54 | +0.005 | 11 37 38.7 | 0.14 | 7 17 5.5 | 2 14 31.60 | +0.001 | 11 37 36.2 | 0.15 |
| 8 | 2 14 31.60 | 0.000 | 11 37 35.1 | 0.16 | 8 17 1.5 | 2 14 31.57 | -0.004 | 11 37 32.2 | 0.18 |
| 9 | 2 14 31.53 | -0.006 | 11 37 30.9 | 0.19 | 9 16 57.6 | 2 14 31.41 | 0.009 | 11 37 27.5 | 0.21 |
| 10 | 2 14 31.33 | 0.011 | 11 37 26.0 | 0.22 | 10 16 53.7 | 2 14 31.12 | 0.015 | 11 37 22.2 | 0.23 |
| 11 | 2 14 31.01 | 0.016 | 11 37 20.5 | 0.24 | 11 16 49.7 | 2 14 30.71 | 0.020 | 11 37 16.3 | 0.26 |
| 12 | 2 14 30.56 | 0.021 | 11 37 14.4 | 0.27 | 12 16 45.8 | 2 14 30.17 | 0.025 | 11 37 9.8 | 0.29 |
| 13 | 2 14 29.98 | 0.027 | 11 37 7.6 | 0.30 | 13 16 41.8 | 2 14 29.50 | 0.030 | 11 37 2.6 | 0.31 |
| 14 | 2 14 29.28 | 0.032 | 11 37 0.2 | 0.32 | 14 16 37.9 | 2 14 28.71 | 0.035 | 11 36 54.7 | 0.34 |
| 15 | 2 14 28.45 | 0.037 | 11 36 52.1 | 0.35 | 15 16 33.9 | 2 14 27.81 | 0.040 | 11 36 46 2 | 0.37 |
| 16 | 2 14 27.50 | 0.042 | 11 36 43 4 | 0.38 | 16 16 30.0 | 2 14 26.78 | 0.046 | 11 36 37.1 | 0.39 |
| 17 | 2 14 26.43 | 0.047 | 11 36 34.1 | 0.40 | 17 16 26.0 | 2 14 25.62 | 0.051 | 11 36 27.3 | 0 42 |
| 18 | 2 14 25.23 | 0.053 | 11 36 24.1 | 0.43 | 18 16 22.1 | 2 14 24.34 | 0.056 | 11 36 16.9 | 0.44 |
| 19 | 2 14 23.90 | 0.058 | 11 36 13.5 | 0.45 | 19 16 18.1 | 2 14 22.93 | 0.061 | 11 36 6.0 | 0.47 |
| 20 | 2 14 22.45 | 0.063 | 11 36 2.3 | 0.48 | 20 16 14.2 | 2 14 21.40 | 0.066 | 11 35 54.4 | 0.50 |
| 21 | 2 14 20.88 | 0.068 | 11 35 50.5 | 0.50 | 21 16 10.2 | 2 14 19.75 | 0.071 | 11 35 42.2 | 0.52 |
| 22 | 2 14 19.18 | 0.073 | 11 35 38.1 | 0.53 | 22 16 6.3 | 2 14 17.97 | 0.076 | 11 35 29.5 | 0.54 |
| 23 | 2 14 17.36 | 0.078 | 11 35 25.1 | 0.56 | 23 16 2.3 | 2 14 16.08 | 0.081 | 11 35 16.1 | 0.57 |
| 24 | 2 14 15.42 | 0.083 | 11 35 11.5 | 0.58 | 24 15 58.3 | 2 14 14.07 | 0.086 | 11 35 2.1 | 0.60 |
| 25 | 2 14 13.37 | 0.088 | 11 34 57.3 | 0.60 | 25 15 54.4 | 2 14 11.94 | 0.091 | 11 34 47.5 | 0.62 |
| 26 | 2 14 11.20 | 0.093 | 11 34 42.5 | 0.63 | 26 15 50.4 | 2 14 9.69 | 0.096 | 11 34 32.3 | 0.64 |
| 27 | 2 14 8.90 | 0.098 | 11 34 27.0 | 0.66 | 27 15 46.4 | 2 14 7.32 | 0.101 | 11 34 16.6 | 0.67 |
| 28 | 2 14 6.48 | 0.103 | 11 34 11.0 | 0.68 | 28 15 42.4 | 2 14 4.84 | 0.106 | 11 34 0.3 | 0.69 |
| 29 | 2 14 3.95 | 0.108 | 11 33 54.5 | 0.70 | 29 15 38.5 | 2 14 2.25 | 0.110 | 11 33 43.4 | 0.71 |
| 30 | 2 14 1.31 | 0.113 | 11 33 37.4 | 0.73 | 30 15 34.5 | 2 13 59.54 | 0.115 | 11 33 26.0 | 0.74 |
| 31 | 2 13 58.55 | -0.117 | +11 33 19.7 | -0.75 | 31 15 30.5 | 2 13 56.71 | -0.120 | +11 33 8.0 | -0.76 |

# NEPTUNE, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Sept. 1 | 2 13 55.68 | −0.122 | +11 33 1.5 | −0.77 | 1 15 26.5 | 2 13 53.77 | −0.125 | +11 32 49.5 | −0.78 |
| 2 | 2 13 52.70 | 0.126 | 11 32 42.8 | 0.79 | 2 15 22.5 | 2 13 50.72 | 0.129 | 11 32 30.5 | 0.80 |
| 3 | 2 13 49.61 | 0.131 | 11 32 23.5 | 0.82 | 3 15 18.6 | 2 13 47.56 | 0.134 | 11 32 10.9 | 0.83 |
| 4 | 2 13 46.40 | 0.136 | 11 32 3.6 | 0.84 | 4 15 14.6 | 2 13 44.30 | 0.138 | 11 31 50.7 | 0.85 |
| 5 | 2 13 43.09 | 0.140 | 11 31 43.2 | 0.86 | 5 15 10.6 | 2 13 40.94 | 0.142 | 11 31 30.1 | 0.87 |
| 6 | 2 13 39.67 | 0.145 | 11 31 22.4 | 0.88 | 6 15 6.6 | 2 13 37.47 | 0.147 | 11 31 9.0 | 0.89 |
| 7 | 2 13 36.15 | 0.149 | 11 31 1.0 | 0.90 | 7 15 2.6 | 2 13 33.89 | 0.151 | 11 30 47.3 | 0.91 |
| 8 | 2 13 32.52 | 0.154 | 11 30 39.1 | 0.92 | 8 14 58.6 | 2 13 30.20 | 0.156 | 11 30 25.1 | 0.93 |
| 9 | 2 13 28.78 | 0.158 | 11 30 16.7 | 0.94 | 9 14 54.6 | 2 13 26.41 | 0.160 | 11 30 2.5 | 0.95 |
| 10 | 2 13 24.94 | 0.162 | 11 29 53.8 | 0.96 | 10 14 50.6 | 2 13 22.52 | 0.164 | 11 29 39.4 | 0.97 |
| 11 | 2 13 21.01 | 0.166 | 11 29 30.4 | 0.98 | 11 14 46.6 | 2 13 18.53 | 0.168 | 11 29 15.7 | 0.99 |
| 12 | 2 13 16.97 | 0.170 | 11 29 6.5 | 1.00 | 12 14 42.6 | 2 13 14.44 | 0.172 | 11 28 51.6 | 1.01 |
| 13 | 2 13 12.83 | 0.174 | 11 28 42.2 | 1.02 | 13 14 38.6 | 2 13 10.26 | 0.176 | 11 28 27.1 | 1.03 |
| 14 | 2 13 8.60 | 0.178 | 11 28 17.4 | 1.04 | 14 14 34.6 | 2 13 5.98 | 0.180 | 11 28 2.1 | 1.05 |
| 15 | 2 13 4.27 | 0.182 | 11 27 52.1 | 1.06 | 15 14 30.6 | 2 13 1.61 | 0.184 | 11 27 36.6 | 1.07 |
| 16 | 2 12 59.85 | 0.186 | 11 27 26.4 | 1.08 | 16 14 26.6 | 2 12 57.15 | 0.188 | 11 27 10.7 | 1.09 |
| 17 | 2 12 55.34 | 0.190 | 11 27 0.2 | 1.10 | 17 14 22.6 | 2 12 52.59 | 0.192 | 11 26 44.3 | 1.11 |
| 18 | 2 12 50.73 | 0.194 | 11 26 33.6 | 1.11 | 18 14 18.6 | 2 12 47.94 | 0.195 | 11 26 17.6 | 1.12 |
| 19 | 2 12 46.03 | 0.197 | 11 26 6.7 | 1.13 | 19 14 14.6 | 2 12 43.20 | 0.199 | 11 25 50.5 | 1.14 |
| 20 | 2 12 41.25 | 0.201 | 11 25 39.4 | 1.15 | 20 14 10.5 | 2 12 38.38 | 0.203 | 11 25 23.0 | 1.15 |
| 21 | 2 12 36.38 | 0.205 | 11 25 11.6 | 1.17 | 21 14 6.5 | 2 12 33.49 | 0.206 | 11 24 55.1 | 1.17 |
| 22 | 2 12 31.43 | 0.208 | 11 24 43.4 | 1.18 | 22 14 2.5 | 2 12 28.50 | 0.210 | 11 24 26.8 | 1.19 |
| 23 | 2 12 26.40 | 0.211 | 11 24 14.9 | 1.20 | 23 13 58.5 | 2 12 23.43 | 0.213 | 11 23 58.1 | 1.20 |
| 24 | 2 12 21.29 | 0.215 | 11 23 46.0 | 1.21 | 24 13 54.5 | 2 12 18.29 | 0.216 | 11 23 29.1 | 1.22 |
| 25 | 2 12 16.10 | 0.218 | 11 23 16.8 | 1.22 | 25 13 50.5 | 2 12 13.07 | 0.219 | 11 22 59.7 | 1.23 |
| 26 | 2 12 10.83 | 0.221 | 11 22 47.2 | 1.23 | 26 13 46.5 | 2 12 7.78 | 0.222 | 11 22 30.0 | 1.24 |
| 27 | 2 12 5.49 | 0.224 | 11 22 17.3 | 1.25 | 27 13 42.4 | 2 12 2.42 | 0.225 | 11 22 0.1 | 1.25 |
| 28 | 2 12 0.09 | 0.226 | 11 21 47.1 | 1.26 | 28 13 38.4 | 2 11 56.99 | 0.228 | 11 21 29.9 | 1.27 |
| 29 | 2 11 54.62 | 0.229 | 11 21 16.6 | 1.28 | 29 13 34.4 | 2 11 51.49 | 0.230 | 11 20 59.3 | 1.28 |
| 30 | 2 11 49.08 | 0.232 | 11 20 45.8 | 1.29 | 30 13 30.4 | 2 11 45.93 | 0.233 | 11 20 28.3 | 1.29 |
| Oct. 1 | 2 11 43.47 | 0.235 | 11 20 14.7 | 1.30 | 1 13 26.3 | 2 11 40.31 | 0.236 | 11 19 57.1 | 1.30 |
| 2 | 2 11 37.80 | 0.238 | 11 19 43.3 | 1.31 | 2 13 22.3 | 2 11 34.62 | 0.238 | 11 19 25.7 | 1.31 |
| 3 | 2 11 32.07 | 0.240 | 11 19 11.7 | 1.32 | 3 13 18.3 | 2 11 28.87 | 0.240 | 11 18 54.0 | 1.32 |
| 4 | 2 11 26.29 | 0.242 | 11 18 39.8 | 1.33 | 4 13 14.3 | 2 11 23.07 | 0.243 | 11 18 22.1 | 1.33 |
| 5 | 2 11 20.45 | 0.244 | 11 18 7.7 | 1.34 | 5 13 10.2 | 2 11 17.22 | 0.245 | 11 17 50.0 | 1.34 |
| 6 | 2 11 14.56 | 0.247 | 11 17 35.4 | 1.35 | 6 13 6.2 | 2 11 11.31 | 0.247 | 11 17 17.7 | 1.35 |
| 7 | 2 11 8.61 | 0.249 | 11 17 2.9 | 1.36 | 7 13 2.2 | 2 11 5.36 | 0.249 | 11 16 45.2 | 1.36 |
| 8 | 2 11 2.61 | 0.251 | 11 16 30.2 | 1.37 | 8 12 58.1 | 2 10 59.36 | 0.251 | 11 16 12.5 | 1.37 |
| 9 | 2 10 56.57 | 0.253 | 11 15 57.3 | 1.38 | 9 12 54.1 | 2 10 53.31 | 0.253 | 11 15 39.5 | 1.38 |
| 10 | 2 10 50.48 | 0.255 | 11 15 24.2 | 1.39 | 10 12 50.1 | 2 10 47.22 | 0.255 | 11 15 6.3 | 1.39 |
| 11 | 2 10 44.35 | 0.256 | 11 14 50.8 | 1.39 | 11 12 46.0 | 2 10 41.08 | 0.257 | 11 14 33.0 | 1.39 |
| 12 | 2 10 38.17 | 0.258 | 11 14 17.3 | 1.40 | 12 12 42.0 | 2 10 34.90 | 0.258 | 11 13 59.5 | 1.40 |
| 13 | 2 10 31.96 | 0.260 | 11 13 43.7 | 1.40 | 13 12 38.0 | 2 10 28.68 | 0.259 | 11 13 25.9 | 1.40 |
| 14 | 2 10 25.71 | 0.261 | 11 13 10.0 | 1.41 | 14 12 33.9 | 2 10 22.43 | 0.261 | 11 12 52.2 | 1.41 |
| 15 | 2 10 19.43 | 0.262 | 11 12 36.2 | 1.41 | 15 12 29.9 | 2 10 16.15 | 0.262 | 11 12 18.4 | 1.41 |
| 16 | 2 10 13.12 | 0.264 | 11 12 2.3 | 1.41 | 16 12 25.9 | 2 10 9.85 | 0.264 | 11 11 44.6 | 1.41 |
| 17 | 2 10 6.78 | 0.265 | 11 11 28.3 | 1.42 | 17 12 21.8 | 2 10 3.51 | 0.265 | 11 11 10.7 | 1.41 |
| 18 | 2 10 0.41 | 0.266 | 11 10 54.2 | 1.42 | 18 12 17.8 | 2 9 57.14 | 0.265 | 11 10 36.7 | 1.42 |
| 19 | 2 9 54.02 | 0.266 | 11 10 20.0 | 1.42 | 19 12 13.7 | 2 9 50.76 | 0.266 | 11 10 2.6 | 1.42 |
| 20 | 2 9 47.62 | 0.267 | 11 9 45.8 | 1.42 | 20 12 9.7 | 2 9 44.37 | 0.267 | 11 9 28.5 | 1.42 |
| 21 | 2 9 41.20 | 0.268 | 11 9 11.6 | 1.42 | 21 12 5.7 | 2 9 37.96 | 0.267 | 11 8 54.3 | 1.42 |
| 22 | 2 9 34.76 | 0.269 | 11 8 37.4 | 1.42 | 22 12 1.6 | 2 9 31.53 | 0.268 | 11 8 20.2 | 1.42 |
| 23 | 2 9 28.31 | 0.269 | 11 8 3.2 | 1.42 | 23 11 57.6 | 2 9 25.09 | 0.269 | 11 7 46.1 | 1.42 |
| 24 | 2 9 21.85 | 0.269 | 11 7 29.0 | 1.42 | 24 11 53.5 | 2 9 18.64 | 0.269 | 11 7 12.0 | 1.42 |
| 25 | 2 9 15.39 | 0.269 | 11 6 54.8 | 1.42 | 25 11 49.5 | 2 9 12.19 | 0.269 | 11 6 38.0 | 1.42 |
| 26 | 2 9 8.92 | 0.269 | 11 6 20.7 | 1.42 | 26 11 45.5 | 2 9 5.74 | 0.269 | 11 6 4.0 | 1.41 |
| 27 | 2 9 2.45 | 0.269 | 11 5 46.6 | 1.42 | 27 11 41.4 | 2 8 59.30 | 0.269 | 11 5 30.1 | 1.41 |
| 28 | 2 8 55.99 | 0.269 | 11 5 12.6 | 1.41 | 28 11 37.4 | 2 8 52.85 | 0.268 | 11 4 56.2 | 1.41 |
| 29 | 2 8 49.52 | 0.269 | 11 4 38.7 | 1.41 | 29 11 33.4 | 2 8 46.41 | 0.268 | 11 4 22.4 | 1.41 |
| 30 | 2 8 43.06 | 0.269 | 11 4 4.9 | 1.41 | 30 11 29.3 | 2 8 39.97 | 0.268 | 11 3 48.7 | 1.40 |
| 31 | 2 8 36.61 | 0.269 | 11 3 31.1 | 1.40 | 31 11 25.5 | 2 8 33.54 | 0.267 | 11 3 15.1 | 1.40 |
| 32 | 2 8 30.17 | −0.268 | +11 2 57.5 | −1.40 | 32 11 21.2 | 2 8 27.14 | −0.267 | +11 2 41.7 | −1.39 |

# NEPTUNE, 1876.

| Date. 1876. | FOR WASHINGTON MEAN NOON. | | | | FOR MERIDIAN TRANSIT. | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Apparent Right Ascension. | Diff. for 1 hour. | Apparent Declination. | Diff. for 1 hour. | Mean Time of Transit. | Apparent Right Ascension. | Diff. for 1 h. of Long. | Apparent Declination. | Diff. for 1 hour of Long. |
| | h m s | s | ° ′ ″ | ″ | d h m | h m s | s | ° ′ ″ | ″ |
| Nov. 1 | 2 8 30.17 | −0.268 | +11 2 57.5 | −1.40 | 1 11 21.2 | 2 8 27.14 | −0.267 | +11 2 41.7 | −1.39 |
| 2 | 2 8 23.75 | 0.267 | 11 2 24.0 | 1.39 | 2 11 17.2 | 2 8 20.74 | 0.266 | 11 2 8.4 | 1.39 |
| 3 | 2 8 17.34 | 0.267 | 11 1 50.7 | 1.39 | 3 11 13.2 | 2 8 14.35 | 0.266 | 11 1 35.2 | 1.38 |
| 4 | 2 8 10.95 | 0.266 | 11 1 17.5 | 1.38 | 4 11 9.1 | 2 8 7.98 | 0.265 | 11 1 2.2 | 1.37 |
| 5 | 2 8 4.57 | 0.265 | 11 0 44.5 | 1.37 | 5 11 5.1 | 2 8 1.64 | 0.264 | 11 0 29.3 | 1.36 |
| 6 | 2 7 58.22 | 0.264 | 11 0 11.7 | 1.36 | 6 11 1 0 | 2 7 55.32 | 0.263 | 10 59 56.7 | 1.35 |
| 7 | 2 7 51.90 | 0.263 | 10 59 39.1 | 1.35 | 7 10 57.0 | 2 7 49.03 | 0.261 | 10 59 24.3 | 1.35 |
| 8 | 2 7 45.61 | 0.261 | 10 59 6.7 | 1.35 | 8 10 53.0 | 2 7 42.77 | 0.260 | 10 58 52.1 | 1.34 |
| 9 | 2 7 39.35 | 0.260 | 10 58 34.5 | 1.34 | 9 10 48.9 | 2 7 36.54 | 0.259 | 10 58 20.1 | 1.33 |
| 10 | 2 7 33.12 | 0.259 | 10 58 2.5 | 1.33 | 10 10 44.9 | 2 7 30.35 | 0.257 | 10 57 48.3 | 1.32 |
| 11 | 2 7 26.93 | 0.257 | 10 57 30.8 | 1.31 | 11 10 40.9 | 2 7 24.18 | 0.256 | 10 57 16.8 | 1.31 |
| 12 | 2 7 20.77 | 0.256 | 10 56 59.4 | 1.30 | 12 10 36.8 | 2 7 18.07 | 0.254 | 10 56 45.6 | 1.29 |
| 13 | 2 7 14.66 | 0.254 | 10 56 28.2 | 1.29 | 13 10 32.8 | 2 7 12.00 | 0.252 | 10 56 14.7 | 1.28 |
| 14 | 2 7 8.60 | 0.252 | 10 55 57.4 | 1.28 | 14 10 28.8 | 2 7 5.97 | 0.250 | 10 55 44.1 | 1.27 |
| 15 | 2 7 2.58 | 0.250 | 10 55 26.9 | 1.26 | 15 10 24.7 | 2 6 59.99 | 0.248 | 10 55 13.8 | 1.26 |
| 16 | 2 6 56.61 | 0.248 | 10 54 56.7 | 1.25 | 16 10 20.7 | 2 6 54.06 | 0.246 | 10 54 43.8 | 1.24 |
| 17 | 2 6 50.69 | 0.246 | 10 54 26.8 | 1.24 | 17 10 16.7 | 2 6 48.17 | 0.244 | 10 54 14.1 | 1.23 |
| 18 | 2 6 44.82 | 0.243 | 10 53 57.2 | 1.23 | 18 10 12.6 | 2 6 42.34 | 0.241 | 10 53 44.8 | 1.21 |
| 19 | 2 6 39.01 | 0.241 | 10 53 28.0 | 1.21 | 19 10 8.6 | 2 6 36.58 | 0.239 | 10 53 15.8 | 1.20 |
| 20 | 2 6 33.27 | 0.238 | 10 52 59.2 | 1.19 | 20 10 4.6 | 2 6 30.88 | 0.236 | 10 52 47.3 | 1.18 |
| 21 | 2 6 27.59 | 0.235 | 10 52 30.8 | 1.18 | 21 10 0.6 | 2 6 25.24 | 0.234 | 10 52 19.2 | 1.16 |
| 22 | 2 6 21.97 | 0.233 | 10 52 2.8 | 1.16 | 22 9 56.5 | 2 6 19.66 | 0.231 | 10 51 51.4 | 1.15 |
| 23 | 2 6 16.41 | 0.230 | 10 51 35.2 | 1.14 | 23 9 52.5 | 2 6 14.14 | 0.228 | 10 51 24.0 | 1.13 |
| 24 | 2 6 10.92 | 0.227 | 10 51 8.0 | 1.12 | 24 9 48.5 | 2 6 8.69 | 0.225 | 10 50 57.1 | 1.11 |
| 25 | 2 6 5.50 | 0.224 | 10 50 41.2 | 1.11 | 25 9 44.5 | 2 6 3.33 | 0.222 | 10 50 30.6 | 1.09 |
| 26 | 2 6 0.15 | 0.221 | 10 50 14.9 | 1.09 | 26 9 40.5 | 2 5 58.02 | 0.219 | 10 50 4.6 | 1.07 |
| 27 | 2 5 54.88 | 0.218 | 10 49 49.1 | 1.07 | 27 9 36.5 | 2 5 52.80 | 0.216 | 10 49 39.0 | 1.06 |
| 28 | 2 5 49.69 | 0.215 | 10 49 23.7 | 1.05 | 28 9 32.4 | 2 5 47.65 | 0.213 | 10 49 13.8 | 1.04 |
| 29 | 2 5 44.58 | 0.211 | 10 48 58.8 | 1.03 | 29 9 28.4 | 2 5 42.58 | 0.210 | 10 48 49.1 | 1.02 |
| 30 | 2 5 39.55 | 0.208 | 10 48 34.3 | 1.01 | 30 9 24.4 | 2 5 37.59 | 0.206 | 10 48 24 8 | 1.00 |
| Dec. 1 | 2 5 34.60 | 0.204 | 10 48 10.3 | 0.99 | 1 9 20.4 | 2 5 32.69 | 0.202 | 10 48 1.1 | 0.98 |
| 2 | 2 5 29.74 | 0.201 | 10 47 46.9 | 0.96 | 2 9 16.4 | 2 5 27.88 | 0.199 | 10 47 37.9 | 0.95 |
| 3 | 2 5 24.97 | 0.197 | 10 47 24.0 | 0.94 | 3 9 12.4 | 2 5 23.16 | 0.195 | 10 47 15.3 | 0.93 |
| 4 | 2 5 20.29 | 0.193 | 10 47 1.6 | 0.92 | 4 9 8.4 | 2 5 18.53 | 0.191 | 10 46 53.2 | 0.91 |
| 5 | 2 5 15.69 | 0.190 | 10 46 39.7 | 0.90 | 5 9 4.3 | 2 5 13.98 | 0.188 | 10 46 31.6 | 0.89 |
| 6 | 2 5 11.19 | 0.186 | 10 46 18.4 | 0.88 | 6 9 0.3 | 2 5 9.52 | 0.184 | 10 46 10.5 | 0.87 |
| 7 | 2 5 6.78 | 0 182 | 10 45 57.6 | 0.86 | 7 8 56.3 | 2 5 5.16 | 0.180 | 10 45 50.0 | 0.84 |
| 8 | 2 5 2.47 | 0.178 | 10 45 37.3 | 0.83 | 8 8 52.3 | 2 5 0.90 | 0.176 | 10 45 30.0 | 0.82 |
| 9 | 2 4 58.25 | 0.174 | 10 45 17.6 | 0.81 | 9 8 48.3 | 2 4 56.73 | 0.172 | 10 45 10.6 | 0.80 |
| 10 | 2 4 54.13 | 0.170 | 10 44 58.6 | 0.78 | 10 8 44.3 | 2 4 52.66 | 0.167 | 10 44 51.8 | 0.77 |
| 11 | 2 4 50.11 | 0.165 | 10 44 40.1 | 0.76 | 11 8 40.3 | 2 4 48.69 | 0.163 | 10 44 33.6 | 0.75 |
| 12 | 2 4 46.20 | 0.161 | 10 44 22.2 | 0.73 | 12 8 36.3 | 2 4 44.83 | 0.159 | 10 44 16.0 | 0.72 |
| 13 | 2 4 42.40 | 0.156 | 10 44 4.9 | 0.71 | 13 8 32.3 | 2 4 41.07 | 0.154 | 10 43 58.9 | 0.70 |
| 14 | 2 4 38.70 | 0.152 | 10 43 48.2 | 0.68 | 14 8 28.4 | 2 4 37.42 | 0.150 | 10 43 42.5 | 0.67 |
| 15 | 2 4 35.11 | 0.147 | 10 43 32.2 | 0.65 | 15 8 24.4 | 2 4 33.88 | 0.145 | 10 43 26.8 | 0.64 |
| 16 | 2 4 31.63 | 0.143 | 10 43 16.8 | 0.63 | 16 8 20.4 | 2 4 30.45 | 0.141 | 10 43 11.7 | 0.62 |
| 17 | 2 4 28.26 | 0.138 | 10 43 2.0 | 0.60 | 17 8 16.4 | 2 4 27.13 | 0.136 | 10 42 57.1 | 0.59 |
| 18 | 2 4 25.01 | 0.133 | 10 42 47.8 | 0.58 | 18 8 12.4 | 2 4 23.92 | 0.131 | 10 42 43.2 | 0.56 |
| 19 | 2 4 21.87 | 0.128 | 10 42 34.3 | 0.55 | 19 8 8.4 | 2 4 20.83 | 0.126 | 10 42 30.0 | 0.54 |
| 20 | 2 4 18.85 | 0.124 | 10 42 21.5 | 0.52 | 20 8 4.5 | 2 4 17.86 | 0.121 | 10 42 17.4 | 0.51 |
| 21 | 2 4 15.94 | 0.119 | 10 42 9.4 | 0.49 | 21 8 0.5 | 2 4 15.01 | 0.116 | 10 42 5.5 | 0.48 |
| 22 | 2 4 13.15 | 0.114 | 10 41 57.9 | 0.46 | 22 7 56.5 | 2 4 12.27 | 0.112 | 10 41 54.2 | 0.46 |
| 23 | 2 4 10.49 | 0.109 | 10 41 47.1 | 0.44 | 23 7 52.5 | 2 4 9.65 | 0.107 | 10 41 43.6 | 0.43 |
| 24 | 2 4 7.95 | 0.104 | 10 41 36.9 | 0.41 | 24 7 48.6 | 2 4 7.15 | 0.102 | 10 41 33.7 | 0.40 |
| 25 | 2 4 5.52 | 0.099 | 10 41 27.4 | 0.38 | 25 7 44.6 | 2 4 4.77 | 0.097 | 10 41 24.5 | 0.37 |
| 26 | 2 4 3.22 | 0.093 | 10 41 18.6 | 0.35 | 26 7 40.6 | 2 4 2.51 | 0.091 | 10 41 15.9 | 0.34 |
| 27 | 2 4 1.04 | 0.088 | 10 41 10.5 | 0.32 | 27 7 36.7 | 2 4 0.38 | 0.086 | 10 41 8.0 | 0.31 |
| 28 | 2 3 58.98 | 0.083 | 10 41 3.1 | 0.29 | 28 7 32.7 | 2 3 58.37 | 0.081 | 10 41 0.9 | 0.28 |
| 29 | 2 3 57.05 | 0.078 | 10 40 56.4 | 0.26 | 29 7 28.7 | 2 3 56.49 | 0.076 | 10 40 54.5 | 0.25 |
| 30 | 2 3 55.25 | 0.073 | 10 40 50.4 | 0.24 | 30 7 24.8 | 2 3 54.73 | 0.071 | 10 40 48.8 | 0.22 |
| 31 | 2 3 53.57 | 0.068 | 10 40 45.1 | 0.21 | 31 7 20.8 | 2 3 53.10 | 0.065 | 10 40 43.7 | 0.20 |
| 32 | 2 3 52.02 | −0.063 | +10 40 40.5 | −0.18 | 32 7 16.9 | 2 3 51.59 | −0.060 | +10 40 39.3 | −0.17 |

## HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

| Mean Noon. | HORIZONTAL PARALLAXES. | | | SEMIDIAMETERS. | | | SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN. | | |
|---|---|---|---|---|---|---|---|---|---|
| | ☿ | ♀ | ♂ | ☿ | ♀ | ♂ | ☿ | ♀ | ♂ |
| | ″ | ″ | ″ | ″ | ″ | ″ | s | s | s |
| Jan. 1 | 6.24 | 5.92 | 6.04 | 2.36 | 5.72 | 3.45 | 0.18 | 0.41 | 0.23 |
| 6 | 6.41 | 6.01 | 5.89 | 2.42 | 5.81 | 3.36 | 0.18 | 0.41 | 0.23 |
| 11 | 6.69 | 6.09 | 5.74 | 2.52 | 5.89 | 3.28 | 0.19 | 0.41 | 0.22 |
| 16 | 7.11 | 6.19 | 5.60 | 2.68 | 5.98 | 3.20 | 0.19 | 0.42 | 0.21 |
| 21 | 7.74 | 6.30 | 5.47 | 2.92 | 6.08 | 3.13 | 0.21 | 0.42 | 0.21 |
| 26 | 8.70 | 6.41 | 5.34 | 3.28 | 6.19 | 3.05 | 0.23 | 0.42 | 0.20 |
| 31 | 10.06 | 6.53 | 5.21 | 3.80 | 6.31 | 2.98 | 0.26 | 0.43 | 0.20 |
| Feb. 5 | 11.76 | 6.66 | 5.09 | 4.44 | 6.44 | 2.91 | 0.31 | 0.43 | 0.19 |
| 10 | 13.25 | 6.80 | 4.98 | 5.00 | 6.57 | 2.84 | 0.35 | 0.44 | 0.19 |
| 15 | 13.79 | 6.95 | 4.88 | 5.21 | 6.71 | 2.78 | 0.36 | 0.45 | 0.18 |
| 20 | 13.26 | 7.11 | 4.79 | 5.01 | 6.87 | 2.73 | 0.35 | 0.46 | 0.18 |
| 25 | 12.21 | 7.29 | 4.69 | 4.61 | 7.04 | 2.67 | 0.33 | 0.47 | 0.18 |
| Mar. 1 | 11.11 | 7.48 | 4.60 | 4.19 | 7.22 | 2.62 | 0.30 | 0.49 | 0.18 |
| 6 | 10.14 | 7.69 | 4.51 | 3.83 | 7.42 | 2.57 | 0.27 | 0.50 | 0.17 |
| 11 | 9.34 | 7.91 | 4.43 | 3.53 | 7.64 | 2.53 | 0.25 | 0.52 | 0.17 |
| 16 | 8.68 | 8.15 | 4.35 | 3.28 | 7.87 | 2.48 | 0.23 | 0.54 | 0.17 |
| 21 | 8.14 | 8.42 | 4.27 | 3.07 | 8.13 | 2.44 | 0.21 | 0.57 | 0.17 |
| 26 | 7.70 | 8.71 | 4.20 | 2.91 | 8.41 | 2.40 | 0.20 | 0.60 | 0.17 |
| 31 | 7.33 | 9.03 | 4.13 | 2.77 | 8.72 | 2.36 | 0.19 | 0.62 | 0.17 |
| April 5 | 7.04 | 9.38 | 4.06 | 2.66 | 9.06 | 2.32 | 0.18 | 0.65 | 0.16 |
| 10 | 6.81 | 9.77 | 4.00 | 2.57 | 9.44 | 2.29 | 0.18 | 0.69 | 0.16 |
| 15 | 6.68 | 10.20 | 3.94 | 2.52 | 9.86 | 2.25 | 0.17 | 0.72 | 0.16 |
| 20 | 6.64 | 10.69 | 3.88 | 2.51 | 10.32 | 2.22 | 0.18 | 0.76 | 0.16 |
| 25 | 6.75 | 11.23 | 3.83 | 2.55 | 10.84 | 2.19 | 0.18 | 0.80 | 0.16 |
| 30 | 7.06 | 11.83 | 3.78 | 2.67 | 11.43 | 2.16 | 0.19 | 0.85 | 0.16 |
| May 5 | 7.59 | 12.49 | 3.74 | 2.87 | 12.07 | 2.13 | 0.21 | 0.90 | 0.15 |
| 10 | 8.35 | 13.24 | 3.70 | 3.15 | 12.79 | 2.11 | 0.24 | 0.95 | 0.15 |
| 15 | 9.31 | 14.08 | 3.66 | 3.52 | 13.58 | 2.09 | 0.27 | 1.01 | 0.15 |
| 20 | 10.47 | 15.03 | 3.62 | 3.95 | 14.51 | 2.07 | 0.30 | 1.07 | 0.15 |
| 25 | 11.79 | 16.11 | 3.58 | 4.45 | 15.56 | 2.04 | 0.33 | 1.15 | 0.15 |
| 30 | 13.20 | 17.33 | 3.54 | 4.99 | 16.74 | 2.02 | 0.37 | 1.23 | 0.15 |
| June 4 | 14.55 | 18.70 | 3.51 | 5.50 | 18.06 | 2.00 | 0.41 | 1.31 | 0.15 |
| 9 | 15.60 | 20.24 | 3.48 | 5.89 | 19.55 | 1.99 | 0.43 | 1.41 | 0.15 |
| 14 | 16.01 | 21.95 | 3.46 | 6.04 | 21.21 | 1.97 | 0.44 | 1.52 | 0.14 |
| 19 | 15.62 | 23.78 | 3.44 | 5.90 | 22.97 | 1.96 | 0.43 | 1.64 | 0.14 |
| 24 | 14.57 | 25.70 | 3.42 | 5.50 | 24.83 | 1.95 | 0.40 | 1.75 | 0.14 |
| 29 | 13.14 | 27.53 | 3.40 | 4.96 | 26.59 | 1.94 | 0.36 | 1.87 | 0.14 |
| July 4 | 11.63 | 29.10 | 3.38 | 4.39 | 28.10 | 1.93 | 0.32 | 1.97 | 0.14 |
| 9 | 10.22 | 30.17 | 3.36 | 3.86 | 29.14 | 1.92 | 0.28 | 2.03 | 0.14 |
| 14 | 9.01 | 30.50 | 3.34 | 3.40 | 29.45 | 1.91 | 0.25 | 2.05 | 0.14 |
| 19 | 8.04 | 30.06 | 3.33 | 3.03 | 29.03 | 1.90 | 0.22 | 2.02 | 0.14 |
| 24 | 7.32 | 28.91 | 3.33 | 2.76 | 27.93 | 1.90 | 0.20 | 1.94 | 0.13 |
| 29 | 6.86 | 27.32 | 3.32 | 2.59 | 26.38 | 1.90 | 0.19 | 1.83 | 0.13 |
| Aug. 3 | 6.61 | 25.51 | 3.31 | 2.50 | 24.64 | 1.90 | 0.18 | 1.71 | 0.13 |
| 8 | 6.53 | 23.65 | 3.31 | 2.46 | 22.84 | 1.89 | 0.18 | 1.59 | 0.13 |
| 13 | 6.56 | 21.87 | 3.30 | 2.48 | 21.13 | 1.89 | 0.17 | 1.47 | 0.13 |
| 18 | 6.68 | 20.23 | 3.30 | 2.52 | 19.54 | 18.9 | 0.17 | 1.36 | 0.13 |
| 23 | 6.87 | 18.75 | 3.30 | 2.59 | 18.10 | 1.89 | 0.18 | 1.26 | 0.13 |
| 28 | 7.13 | 17.42 | 3.31 | 2.69 | 16.83 | 1.89 | 0.18 | 1.17 | 0.13 |
| Sept. 2 | 7.46 | 16.25 | 3.32 | 2.82 | 15.70 | 1.90 | 0.19 | 1.09 | 0.13 |
| 7 | 7.86 | 15.20 | 3.33 | 2.97 | 14.68 | 1.90 | 0.20 | 1.02 | 0.13 |
| 12 | 8.38 | 14.27 | 3.34 | 3.16 | 13.79 | 1.91 | 0.22 | 0.96 | 0.13 |
| 17 | 9.02 | 13.45 | 3.36 | 3.40 | 12.99 | 1.92 | 0.24 | 0.90 | 0.13 |
| 22 | 9.82 | 12.71 | 3.37 | 3.71 | 12.28 | 1.93 | 0.26 | 0.85 | 0.13 |
| 27 | 10.82 | 12.05 | 3.39 | 4.09 | 11.63 | 1.94 | 0.29 | 0.80 | 0.13 |
| Oct. 2 | 11.98 | 11.46 | 3.41 | 4.52 | 11.07 | 1.95 | 0.32 | 0.76 | 0.13 |
| 7 | 13.02 | 10.93 | 3.43 | 4.91 | 10.55 | 1.96 | 0.34 | 0.72 | 0.13 |
| 12 | 13.33 | 10.45 | 3.45 | 5.03 | 10.08 | 1.97 | 0.34 | 0.68 | 0.13 |
| 17 | 12.43 | 10.01 | 3.48 | 4.60 | 9.66 | 1.99 | 0.32 | 0.65 | 0.13 |
| 22 | 10.81 | 9.61 | 3.51 | 4.08 | 9.29 | 2.01 | 0.28 | 0.62 | 0.13 |

## HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

| Mean Noon. | HORIZONTAL PARALLAXES. | | | SEMIDIAMETERS. | | | SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN. | | |
|---|---|---|---|---|---|---|---|---|---|
| | ☿ | ♀ | ♂ | ☿ | ♀ | ♂ | ☿ | ♀ | ♂ |
| Oct. 27 | 9″.28 | 9″.25 | 3″.55 | 3″.50 | 8″.94 | 2″.03 | 0ˢ.24 | 0ˢ.60 | 0ˢ.14 |
| Nov. 1 | 8.15 | 8.92 | 3.58 | 3.08 | 8.62 | 2.05 | 0.21 | 0.57 | 0.14 |
| 6 | 7.39 | 8.62 | 3.62 | 2.79 | 8.32 | 2.07 | 0.19 | 0.55 | 0.14 |
| 11 | 6.87 | 8.34 | 3.66 | 2.59 | 8.05 | 2.09 | 0.18 | 0.53 | 0.14 |
| 16 | 6.53 | 8.08 | 3.71 | 2.47 | 7.80 | 2.12 | 0.17 | 0.52 | 0.14 |
| 21 | 6.31 | 7.85 | 3.76 | 2.38 | 7.57 | 2.15 | 0.17 | 0.51 | 0.14 |
| 26 | 6.17 | 7.63 | 3.82 | 2.33 | 7.36 | 2.18 | 0.17 | 0.50 | 0.15 |
| Dec. 1 | 6.11 | 7.43 | 3.88 | 2.31 | 7.17 | 2.21 | 0.17 | 0.49 | 0.15 |
| 6 | 6.10 | 7.24 | 3.94 | 2.30 | 6.99 | 2.25 | 0.17 | 0.48 | 0.15 |
| 11 | 6.16 | 7.06 | 4.00 | 2.32 | 6.83 | 2.28 | 0.17 | 0.47 | 0.15 |
| 16 | 6.28 | 6.90 | 4.07 | 2.37 | 6.67 | 2.32 | 0.18 | 0.46 | 0.16 |
| 21 | 6.48 | 6.76 | 4.14 | 2.45 | 6.53 | 2.36 | 0.18 | 0.45 | 0.16 |
| 26 | 6.79 | 6.62 | 4.22 | 2.56 | 6.39 | 2.41 | 0.19 | 0.45 | 0.17 |
| 31 | 7.25 | 6.49 | 4.31 | 2.74 | 6.26 | 2.47 | 0.20 | 0.44 | 0.17 |
| Mean Noon. | ♃ | ♄ | ♅ | ♃ | ♄ | ♅ | ♃ | ♄ | ♅ |
| Jan. 1 | 1″.46 | 0″.84 | 0″.50 | 15″.58 | 7′.43 | 1″.90 | 1ˢ.16 | 0ˢ.55 | 0ˢ.13 |
| 11 | 1.50 | 0.83 | 0.50 | 15.92 | 7.36 | 1.91 | 1.19 | 0.54 | 0.13 |
| 21 | 1.54 | 0.83 | 0.51 | 16.31 | 7.31 | 1.92 | 1.22 | 0.54 | 0.13 |
| 31 | 1.58 | 0.82 | 0.51 | 16.74 | 7.27 | 1.92 | 1.25 | 0.53 | 0.13 |
| Feb. 10 | 1.62 | 0.82 | 0.51 | 17.22 | 7.25 | 1.92 | 1.29 | 0.53 | 0.13 |
| 20 | 1.67 | 0.82 | 0.51 | 17.75 | 7.24 | 1.92 | 1.33 | 0.53 | 0.13 |
| Mar. 1 | 1.72 | 0.82 | 0.51 | 18.31 | 7.26 | 1.92 | 1.38 | 0.53 | 0.13 |
| 11 | 1.78 | 0.83 | 0.50 | 18.89 | 7.29 | 1.91 | 1.42 | 0.53 | 0.13 |
| 21 | 1.83 | 0.83 | 0.50 | 19.47 | 7.34 | 1.90 | 1.46 | 0.53 | 0.13 |
| 31 | 1.88 | 0.84 | 0.50 | 20.03 | 7.40 | 1.88 | 1.50 | 0.54 | 0.13 |
| April 10 | 1.93 | 0.85 | 0.49 | 20.54 | 7.48 | 1.86 | 1.54 | 0.54 | 0.13 |
| 20 | 1.97 | 0.86 | 0.49 | 20.97 | 7.57 | 1.84 | 1.57 | 0.55 | 0.13 |
| 30 | 2.00 | 0.87 | 0.48 | 21.30 | 7.68 | 1.83 | 1.60 | 0.56 | 0.12 |
| May 10 | 2.02 | 0.88 | 0.48 | 21.50 | 7.80 | 1.81 | 1.61 | 0.57 | 0.12 |
| 20 | 2.03 | 0.90 | 0.47 | 21.55 | 7.93 | 1.80 | 1.61 | 0.57 | 0.12 |
| 30 | 2.02 | 0.91 | 0.47 | 21.45 | 8.06 | 1.78 | 1.60 | 0.58 | 0.12 |
| June 9 | 2.00 | 0.93 | 0.47 | 21.22 | 8.20 | 1.77 | 1.59 | 0.59 | 0.12 |
| 19 | 1.97 | 0.94 | 0.46 | 20.87 | 8.34 | 1.76 | 1.56 | 0.60 | 0.12 |
| 29 | 1.93 | 0.96 | 0.46 | 20.43 | 8.48 | 1.75 | 1.52 | 0.61 | 0.12 |
| July 9 | 1.88 | 0.97 | 0.46 | 19.93 | 8.61 | 1.74 | 1.48 | 0.62 | 0.12 |
| 19 | 1.83 | 0.99 | 0.46 | 19.39 | 8.72 | 1.73 | 1.44 | 0.63 | 0.12 |
| 29 | 1.78 | 1.00 | 0.46 | 18.83 | 8.81 | 1.73 | 1.40 | 0.64 | 0.12 |
| Aug. 8 | 1.72 | 1.01 | 0.46 | 18.27 | 8.88 | 1.73 | 1.36 | 0.65 | 0.12 |
| 18 | 1.67 | 1.01 | 0.46 | 17.74 | 8.93 | 1.73 | 1.32 | 0.65 | 0.12 |
| 28 | 1.63 | 1.01 | 0.46 | 17.25 | 8.94 | 1.73 | 1.28 | 0.65 | 0.12 |
| Sept. 7 | 1.58 | 1.01 | 0.46 | 16.80 | 8.92 | 1.74 | 1.25 | 0.65 | 0.12 |
| 17 | 1.54 | 1.00 | 0.46 | 16.39 | 8.87 | 1.75 | 1.23 | 0.65 | 0.12 |
| 27 | 1.50 | 0.99 | 0.46 | 16.03 | 8.80 | 1.76 | 1.21 | 0.64 | 0.12 |
| Oct. 7 | 1.47 | 0.98 | 0.47 | 15.72 | 8.70 | 1.77 | 1.19 | 0.64 | 0.12 |
| 17 | 1.45 | 0.97 | 0.47 | 15.46 | 8.58 | 1.78 | 1.17 | 0.63 | 0.12 |
| 27 | 1.43 | 0.96 | 0.48 | 15.25 | 8.45 | 1.80 | 1.16 | 0.62 | 0.12 |
| Nov. 6 | 1.42 | 0.94 | 0.48 | 15.09 | 8.31 | 1.82 | 1.15 | 0.61 | 0.13 |
| 16 | 1.41 | 0.93 | 0.48 | 14.98 | 8.17 | 1.83 | 1.14 | 0.60 | 0.13 |
| 26 | 1.40 | 0.91 | 0.49 | 14.93 | 8.03 | 1.85 | 1.14 | 0.59 | 0.13 |
| Dec. 6 | 1.40 | 0.89 | 0.49 | 14.92 | 7.90 | 1.87 | 1.14 | 0.58 | 0.13 |
| 16 | 1.41 | 0.88 | 0.50 | 14.97 | 7.77 | 1.88 | 1.15 | 0.57 | 0.13 |
| 26 | 1.42 | 0.87 | 0.50 | 15.07 | 7.66 | 1.90 | 1.16 | 0.56 | 0.13 |
| 36 | 1.43 | 0.86 | 0.50 | 15.22 | 7.56 | 1.91 | 1.17 | 0.55 | 0.13 |

**Horizontal Parallax of Neptune, 0″.30, Jan. 1 to Feb. 3, July 16 to Sept. 20, and after Nov. 30.**
“ “ “ 0″.29, Feb. 4 to July 15.
“ “ “ 0″.31, Sept. 21 to Nov. 30.

# SUN'S COÖRDINATES, 1876.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ = ☉'s True Longitude. | λ′ | β = ☉'s Latitude. | Log. Rad. Vect. = ρ. |
| Jan. 1.0 | +.1826509 | 6533 | −.8862769 | 2925 | −.3845881 | 5508 | 280° 42′ 20″.6 | 21″.1 | −0″.15 | 9.99<br>26586 |
| 1.5 | .1912359 | 2414 | .8847488 | 7645 | .3839247 | 8874 | 281 12 55.8 | 56.2 | 0.09 | 26575 |
| 2.0 | .1998128 | 8143 | .8831518 | 1676 | .3832314 | 1942 | 281 43 31.0 | 31.3 | −0.03 | 26569 |
| 2.5 | .2083700 | 3710 | .8814861 | 5019 | .3825082 | 4710 | 282 14 6.2 | 6.4 | +0.03 | 26568 |
| 3.0 | .2169106 | 9112 | .8797518 | 7677 | .3817553 | 7182 | 282 44 41.3 | 41.4 | 0.10 | 26573 |
| 3.5 | .2254339 | 4340 | .8779491 | 9651 | .3809727 | 9357 | 283 15 16.3 | 16.3 | 0.17 | 26583 |
| 4.0 | .2339392 | 9389 | .8760781 | 0942 | .3801604 | 1235 | 283 45 51.1 | 51.0 | 0.23 | 26599 |
| 4.5 | .2424260 | 4252 | .8741390 | 1551 | .3793187 | 2819 | 284 16 25.9 | 25.7 | 0.29 | 26620 |
| 5.0 | .2508937 | 8925 | .8721320 | 1482 | .3784476 | 4109 | 284 47 0.6 | 0.3 | 0.35 | 26647 |
| 5.5 | .2593414 | 3397 | .8700573 | 0736 | .3775471 | 5105 | 285 17 35.1 | 34.7 | 0.41 | 26681 |
| 6.0 | .2677686 | 7665 | .8679151 | 9315 | .3766173 | 5808 | 285 48 9.5 | 9.0 | 0.46 | 26721 |
| 6.5 | .2761747 | 1721 | .8657056 | 7221 | .3756584 | 6220 | 286 18 43.9 | 43.3 | 0.50 | 26768 |
| 7.0 | .2845591 | 5561 | .8634290 | 4456 | .3746704 | 6342 | 286 49 18.2 | 17.5 | 0.54 | 26821 |
| 7.5 | .2929212 | 9178 | .8610856 | 1023 | .3736534 | 6175 | 287 19 52.3 | 51.5 | 0.57 | 26881 |
| 8.0 | .3012602 | 2564 | .8586756 | 6925 | .3726076 | 5717 | 287 50 26.3 | 25.4 | 0.59 | 26948 |
| 8.5 | .3095757 | 5715 | .8561991 | 2161 | .3715329 | 4971 | 288 20 60.2 | 59.2 | 0.61 | 27021 |
| 9.0 | .3178671 | 8625 | .8536563 | 6734 | .3704295 | 3939 | 288 51 34.0 | 32.9 | 0.62 | 27101 |
| 9.5 | .3261337 | 1287 | .8510474 | 0646 | .3692974 | 2619 | 289 22 7.7 | 6.5 | 0.62 | 27189 |
| 10.0 | .3343750 | 3696 | .8483727 | 3901 | .3681368 | 1015 | 289 52 41.3 | 40.0 | 0.61 | 27284 |
| 10.5 | .3425903 | 5845 | .8456324 | 6499 | .3669478 | 9127 | 290 23 14.8 | 13.4 | 0.60 | 27386 |
| 11 0 | .3507791 | 7729 | .8428267 | 8444 | .3657304 | 6955 | 290 53 48.2 | 46.8 | 0.59 | 27495 |
| 11.5 | .3589408 | 9342 | .8399558 | 9736 | .3644847 | 4500 | 291 24 21.5 | 20.0 | 0.56 | 27612 |
| 12.0 | .3670747 | 0677 | .8370199 | 0379 | .3632108 | 1763 | 291 54 54.7 | 53.1 | 0.53 | 27735 |
| 12.5 | .3751804 | 1730 | .8340191 | 0373 | .3619089 | 8746 | 292 25 27.8 | 26.1 | 0.49 | 27865 |
| 13.0 | .3832572 | 2494 | .8309537 | 9721 | .3605790 | 5449 | 292 55 60.9 | 59.1 | 0.45 | 28002 |
| 13.5 | .3913044 | 2962 | .8278240 | 8425 | .3592212 | 1873 | 293 26 33.9 | 32.0 | 0.40 | 28146 |
| 14.0 | .3993215 | 3130 | .8246301 | 6488 | .3578356 | 8019 | 293 57 6.8 | 4.8 | 0.34 | 28297 |
| 14.5 | .4073079 | 2990 | .8213723 | 3912 | .3564222 | 3887 | 294 27 39.6 | 37.5 | 0.28 | 28454 |
| 15.0 | .4152631 | 2538 | .8180507 | 0698 | .3549811 | 9478 | 294 58 12.3 | 10.1 | 0.22 | 28617 |
| 15.5 | .4231864 | 1767 | .8146655 | 6848 | .3535124 | 4793 | 295 28 45.0 | 42.7 | 0.16 | 28787 |
| 16.0 | .4310772 | 0672 | .8112170 | 2365 | .3520163 | :9835 | 295 59 17.6 | 15.3 | 0.09 | 28963 |
| 16.5 | .4389349 | 9245 | .8077056 | 7253 | .3504929 | 4603 | 296 29 50.1 | 47.7 | +0.03 | 29146 |
| 17.0 | .4467590 | 7483 | .8041313 | 1512 | .3489423 | 9099 | 297 0 22.6 | 20.1 | −0.04 | 29335 |
| 17.5 | .4545488 | 5378 | .8004944 | 5145 | .3473645 | 3323 | 297 30 55.0 | 52.4 | 0.10 | 29530 |
| 18.0 | .4623036 | 2923 | .7967953 | 8156 | .3457597 | 7278 | 298 1 27.3 | 24.6 | 0.17 | 29730 |
| 18.5 | .4700229 | 0113 | .7930342 | 0547 | .3441280 | 0963 | 298 31 59.5 | 56.7 | 0.23 | 29936 |
| 19.0 | .4777061 | 6942 | .7892112 | 2319 | .3424695 | 4381 | 299 2 31.6 | 28.7 | 0.29 | 30147 |
| 19.5 | .4853526 | 3404 | .7853268 | 3477 | .3407842 | 7530 | 299 33 3.6 | 0.6 | 0.34 | 30362 |
| 20.0 | .4929617 | 9492 | .7813812 | 4024 | .3390723 | 0414 | 300 3 35.5 | 32.4 | 0.38 | 30583 |
| 20.5 | .5005328 | 5200 | .7773746 | 3960 | .3373340 | 3033 | 300 34 7.3 | 4.1 | 0.42 | 30809 |
| 21.0 | .5080653 | 0522 | .7733073 | 3289 | .3355693 | 5389 | 301 4 39.1 | 35.8 | 0.45 | 31039 |
| 21.5 | .5155585 | 5451 | .7691797 | 2015 | .3337783 | 7481 | 301 35 10.7 | 7.3 | 0.47 | 31273 |
| 22.0 | 5230118 | :9983 | .7649921 | :0142 | .3319612 | 9314 | 302 5 42.1 | 38.7 | 0.49 | 31512 |
| 22.5 | .5304246 | 4107 | .7607450 | 7673 | .3301183 | 0888 | 302 36 13.4 | 9.9 | 0.50 | 31756 |
| 23.0 | .5377963 | 7822 | .7564385 | 4611 | .3282497 | 2205 | 303 6 44.5 | 40.9 | 0.51 | 32004 |
| 23.5 | .5451263 | 1119 | .7520730 | 0958 | .3263554 | 3265 | 303 37 15.4 | 11.7 | 0.50 | 32255 |
| 24.0 | .5524139 | 3993 | .7476488 | 6719 | .3244355 | 4069 | 304 7 46.2 | 42.4 | 0.49 | 32510 |
| 24.5 | .5596586 | 6437 | .7431662 | 1895 | .3224902 | 4619 | 304 38 16.9 | 13.0 | 0.47 | 32769 |
| 25.0 | .5668598 | 8447 | .7386255 | 6491 | .3205198 | 4918 | 305 8 47.3 | 43.3 | 0.45 | 33031 |
| 25.5 | .5740169 | 0015 | .7340270 | 0508 | .3185243 | 4966 | 305 39 17.5 | 13.4 | 0.41 | 33296 |
| 26.0 | .5811292 | 1136 | .7293715 | 3956 | .3165040 | 4767 | 306 9 47.5 | 43.3 | 0.37 | 33565 |
| 26.5 | .5881962 | 1803 | .7246593 | 6836 | .3144590 | 4320 | 306 40 17.2 | 13.0 | 0.32 | 33838 |
| 27.0 | .5952174 | 2013 | .7198909 | 9155 | .3123895 | 3629 | 307 10 46.7 | 42.4 | 0.27 | 34115 |
| 27.5 | .6021922 | 1759 | .7150666 | 0914 | .3102958 | 2695 | 307 41 15.9 | 11.5 | 0.21 | 34395 |
| 28.0 | .6091200 | 1035 | .7101868 | 2120 | .3081780 | 1521 | 308 11 44.9 | 40.4 | 0.15 | 34678 |
| 28.5 | .6160001 | :9834 | .7052520 | 2774 | .3060363 | 0107 | 308 42 13.6 | 9.0 | 0.09 | 34965 |
| 29.0 | .6228322 | 8153 | .7002625 | 2883 | .3038709 | 8457 | 309 12 41.9 | 37.2 | −0.03 | 35257 |
| 29.5 | .6296157 | 5986 | .6952188 | 2449 | .3016819 | 6570 | 309 43 9.9 | 5.1 | +0.03 | 35553 |
| 30.0 | .6363500 | 3328 | .6901213 | 1477 | .2994696 | 4451 | 310 13 37.6 | 32.8 | 0.10 | 35852 |
| 30.5 | .6430346 | 0172 | .6849705 | 9972 | .2972342 | 2100 | 310 44 5.0 | 0.1 | 0.16 | 36154 |
| 31.0 | .6496692 | 6517 | .6797668 | 7938 | .2949758 | 9520 | 311 14 32.1 | 27.1 | 0.23 | 36461 |
| 31.5 | +.6562532 | 2355 | −.6745106 | 5379 | −.2926945 | 6711 | 311 44 58.8 | 53.8 | +0.29 | 36772 |

NOTE.—The accented letters correspond to the mean equinox and equator of Jan. 0d.0.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ=☉'s True Longitude. | λ′ | β=☉'s Latitude. | Log. Rad. Vect. = ρ. |
| Feb. 1.0 | +.6627861 | 7683 | —.6692024 | 2300 | —.2903906 | 3676 | 312° 15′ 25″.1 | 20″.1 | +0″.36 | 9.99<br>37088 |
| 1.5 | .6692674 | 2494 | .6638425 | 8704 | .2880644 | 0417 | 312 45 51.2 | 46.1 | 0.42 | 37408 |
| 2.0 | .6756967 | 6786 | .6584314 | 4596 | .2857161 | 6928 | 313 16 17.0 | 11.7 | 0.48 | 37732 |
| 2.5 | .6820736 | 0554 | .6529698 | 9983 | .2833459 | 3240 | 313 46 42.3 | 36.9 | 0.53 | 38061 |
| 3.0 | .6883975 | 3792 | .6474582 | 4870 | .2809540 | 9326 | 314 17 7.3 | 1.8 | 0.57 | 38395 |
| 3.5 | .6946681 | 6497 | .6418970 | 9261 | .2785408 | 5196 | 314 47 31.9 | 26.3 | 0.60 | 38734 |
| 4.0 | .7008849 | 8664 | .6362866 | 3160 | .2761062 | 0854 | 315 17 56.0 | 50.4 | 0.63 | 39079 |
| 4.5 | .7070475 | 0289 | .6306275 | 6572 | .2736505 | 6301 | 315 48 19.8 | 14.2 | 0.65 | 39429 |
| 5.0 | .7131554 | 1367 | .6249200 | 9500 | .2711738 | 1538 | 316 18 43.3 | 37.6 | 0.66 | 39784 |
| 5.5 | .7192083 | 1895 | .6191647 | 1950 | .2686762 | 6566 | 316 49 6.4 | 0.6 | 0.67 | 40144 |
| 6.0 | .7252058 | 1870 | .6133619 | 3925 | .2661581 | 1389 | 317 19 29.2 | 23.3 | 0.67 | 40510 |
| 6.5 | .7311473 | 1284 | .6075120 | 5429 | .2636197 | 6009 | 317 49 51.6 | 45.6 | 0.66 | 40881 |
| 7.0 | .7370325 | 0136 | .6016156 | 6468 | .2610612 | 0428 | 318 20 13.7 | 7.6 | 0.64 | 41258 |
| 7.5 | .7428611 | 8421 | .5956733 | 7048 | .2584827 | 4647 | 318 50 35.4 | 29.2 | 0.62 | 41640 |
| 8.0 | .7486327 | 6137 | .5896854 | 7172 | .2558845 | 8669 | 319 20 56.7 | 50.5 | 0.59 | 42029 |
| 8.5 | .7543468 | 3278 | .5836525 | 6846 | .2532668 | 2496 | 319 51 17.7 | 11.4 | 0.55 | 42424 |
| 9.0 | .7600030 | :9840 | .5775750 | 6074 | .2506297 | 6130 | 320 21 38.3 | 31.9 | 0.51 | 42824 |
| 9.5 | .7656012 | 5822 | .5714534 | 4860 | .2479737 | 9573 | 320 51 58.5 | 52.1 | 0.46 | 43230 |
| 10.0 | .7711409 | 1219 | .5652880 | 3209 | .2452986 | 2826 | 321 22 18.4 | 12.0 | 0.40 | 43642 |
| 10.5 | .7766215 | 6025 | .5590793 | 1125 | .2426047 | 5891 | 321 52 38.0 | 31.5 | 0.34 | 44059 |
| 11.0 | .7820427 | 0237 | .5528277 | 8612 | .2398922 | 8771 | 322 22 57.3 | 50.7 | 0.28 | 44482 |
| 11.5 | .7874043 | 3863 | .5465336 | 5673 | .2371613 | 1466 | 322 53 16.2 | 9.5 | 0.22 | 44911 |
| 12.0 | .7927058 | 6868 | .5401975 | 2315 | .2344122 | 3980 | 323 23 34.8 | 28.0 | 0.16 | 45345 |
| 12.5 | .7979468 | 9278 | .5338200 | 8543 | .2316451 | 6313 | 323 53 53.1 | 46.3 | 0.10 | 45785 |
| 13.0 | .8031268 | 1079 | .5274016 | 4362 | .2288603 | 8470 | 324 24 11.1 | 4.2 | +0.03 | 46230 |
| 13.5 | .8082456 | 2267 | .5209427 | 9775 | .2260579 | 0450 | 324 54 28.8 | 21.8 | —0.03 | 46681 |
| 14.0 | .8133028 | 2840 | .5144438 | 4789 | .2232380 | 2256 | 325 24 46.1 | 39.1 | 0.09 | 47136 |
| 14.5 | .8182979 | 2791 | .5079052 | 9406 | .2204009 | 3889 | 325 54 63.1 | 56.1 | 0.15 | 47595 |
| 15.0 | .8232305 | 2118 | .5013275 | 3632 | .2175469 | 5354 | 326 25 19.8 | 12.7 | 0.21 | 48059 |
| 15.5 | .8281003 | 0816 | .4947111 | 7470 | .2146761 | 6650 | 326 55 36.2 | 29.0 | 0.26 | 48528 |
| 16.0 | .8329070 | 8884 | .4880565 | 0927 | .2117887 | 7781 | 327 25 52.3 | 45.0 | 0.31 | 49001 |
| 16.5 | .8376502 | 6317 | .4813641 | 4006 | .2088849 | 8747 | 327 56 8.1 | 0.7 | 0.36 | 49478 |
| 17.0 | .8423294 | 3110 | .4746344 | 6713 | .2059649 | 9551 | 328 26 23.6 | 16.1 | 0.39 | 49958 |
| 17.5 | .8469443 | 9260 | .4678680 | 9051 | .2030289 | 0196 | 328 56 38.8 | 31.2 | 0.42 | 50442 |
| 18.0 | .8514946 | 4764 | .4610655 | 1029 | .2000772 | 0684 | 329 26 53.7 | 46.0 | 0.44 | 50930 |
| 18.5 | .8559798 | 9617 | .4542274 | 2651 | .1971100 | 1017 | 329 57 8.2 | 0.5 | 0.46 | 51421 |
| 19.0 | .8603996 | 3816 | .4473542 | 3921 | .1941275 | 1197 | 330 27 22.4 | 14.7 | 0.47 | 51915 |
| 19.5 | .8647536 | 7357 | .4404465 | 4847 | .1911299 | 1225 | 330 57 36.3 | 28.5 | 0.47 | 52419 |
| 20.0 | .8690414 | 0236 | .4335048 | 5433 | .1881175 | 1106 | 331 27 49.8 | 42.0 | 0.46 | 52911 |
| 20.5 | .8732627 | 2450 | .4265296 | 5684 | .1850906 | 0842 | 331 57 62.9 | 55.0 | 0.44 | 53413 |
| 21.0 | .8774171 | 3996 | .4195216 | 5606 | .1820494 | 0435 | 332 28 15.7 | 7.7 | 0.41 | 53917 |
| 21.5 | .8815044 | 4870 | .4124812 | 5205 | .1789942 | 9887 | 332 58 28.1 | 20.0 | 0.38 | 54424 |
| 22.0 | .8855242 | 5070 | .4054090 | 4485 | .1759252 | 9202 | 333 28 40.1 | 31.9 | 0.34 | 54933 |
| 22.5 | .8894762 | 4591 | .3983055 | 3453 | .1728426 | 8381 | 333 58 51.7 | 43.5 | 0.30 | 55443 |
| 23.0 | .8933600 | 3431 | .3911714 | 2114 | .1697466 | 7426 | 334 28 63.0 | 54.7 | 0.25 | 55955 |
| 23.5 | .8971752 | 1585 | .3840073 | 0476 | .1666375 | 6339 | 334 59 13.8 | 5.5 | 0.20 | 56469 |
| 24.0 | .9009217 | 9052 | .3768138 | 8543 | .1635156 | 5125 | 335 29 24.2 | 15.9 | 0.14 | 56985 |
| 24.5 | .9045993 | 5830 | .3695914 | 6322 | .1603811 | 3785 | 335 59 34.1 | 25.8 | 0.08 | 57502 |
| 25.0 | .9082076 | 1915 | .3623407 | 3817 | .1572343 | 2322 | 336 29 43.6 | 35.2 | —0.01 | 58020 |
| 25.5 | .9117461 | 7302 | .3550623 | 1036 | .1540756 | 0740 | 336 59 52.7 | 44.2 | +0.06 | 58541 |
| 26.0 | .9152147 | 1990 | .3477567 | 7982 | .1509051 | 9040 | 337 29 61.4 | 52.8 | 0.12 | 59064 |
| 26.5 | .9186134 | 5979 | .3404245 | 4663 | .1477231 | 7225 | 338 0 9.7 | 1.0 | 0.19 | 59588 |
| 27.0 | .9219419 | 9267 | .3330665 | 1085 | .1445299 | 5298 | 338 30 17.4 | 8.7 | 0.25 | 60113 |
| 27.5 | .9251997 | 1847 | .3256833 | 7256 | .1413257 | 3260 | 339 0 24.6 | 15.8 | 0.32 | 60640 |
| 28.0 | .9283868 | 3721 | .3182755 | 3180 | .1381108 | 1116 | 339 30 31.3 | 22.4 | 0.38 | 61169 |
| 28.5 | .9315031 | 4886 | .3108438 | 8865 | .1348854 | 8867 | 340 0 37.4 | 28.5 | 0.44 | 61699 |
| 29.0 | .9345483 | 5341 | .3033887 | 4316 | .1316499 | 6517 | 340 30 43.0 | 34.1 | 0.50 | 62231 |
| 29.5 | .9375222 | 5082 | .2959108 | 9540 | .1284047 | 4070 | 341 0 48.2 | 39.2 | 0.55 | 62765 |
| Mar. 1.0 | .9404247 | 4110 | .2884107 | 4541 | .1251499 | 1527 | 341 30 52.9 | 43.8 | 0.60 | 63302 |
| 1.5 | .9432556 | 2422 | .2808890 | 9326 | .1218858 | 8891 | 342 0 57.0 | 47.9 | 0.64 | 63841 |
| 2.0 | .9460148 | 0017 | .2733463 | 3901 | .1186127 | 6165 | 342 30 60.6 | 51.4 | 0.67 | 64382 |
| 2.5 | +.9487020 | 6892 | —.2657831 | 8271 | —.1153307 | 3350 | 343 0 63.7 | 54.4 | +0.69 | 64925 |

**Note.**—: denotes a change in the preceding figure.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ=☉'s True Longitude. | λ′ | β=☉'s Latitude. | Log. Rad. Vect.=ρ. |
| | | | | | | | | | | 9.99 |
| Mar. 3.0 | +.9513172 | 3047 | −.2582001 | 2443 | −.1120401 | 0448 | 343° 30′ 66″.2 | 56″.9 | +0″.71 | 65471 |
| 3.5 | .9538602 | 8480 | .2505979 | 6423 | .1087412 | 7464 | 344 0 68.2 | 58.8 | 0.72 | 66019 |
| 4.0 | .9563310 | 3191 | .2429771 | :0217 | .1054342 | 4399 | 344 31 9.6 | 0.2 | 0.73 | 66570 |
| 4.5 | .9587294 | 7178 | .2353382 | 3830 | .1021193 | 1255 | 345 0 10.5 | 1.0 | 0.72 | 67124 |
| 5.0 | .9610553 | 0440 | .2276819 | 7269 | .0987969 | 8036 | 345 31 10.9 | 1.3 | 0.71 | 67680 |
| 5.5 | .9633085 | 2975 | .2200087 | 0539 | .0954673 | 4745 | 346 1 10.7 | 1.1 | 0.68 | 68240 |
| 6.0 | .9654890 | 4783 | .2123192 | 3645 | .0921308 | 1385 | 346 31 10.0 | 0.3 | 0.65 | 68803 |
| 6.5 | .9675967 | 5863 | .2046139 | 6594 | .0887875 | 7957 | 347 0 68.7 | 59.0 | 0.62 | 69369 |
| 7.0 | .9696315 | 6215 | .1968935 | 9392 | .0854376 | 4463 | 347 30 66.9 | 57.2 | 0.58 | 69938 |
| 7.5 | .9715934 | 5837 | .1891585 | 2044 | .0820813 | 0905 | 348 0 64.7 | 54.9 | 0.53 | 70511 |
| 8.0 | .9734823 | 4730 | .1814095 | 4555 | .0787189 | 7286 | 348 30 62.0 | 52.1 | 0.48 | 71087 |
| 8.5 | .9752980 | 2890 | .1736471 | 6933 | .0753507 | 3609 | 349 0 58.7 | 48.8 | 0.43 | 71666 |
| 9.0 | .9770405 | 0319 | .1658718 | 9181 | .0719769 | 9876 | 349 30 54.8 | 44.9 | 0.37 | 72249 |
| 9.5 | .9787097 | 7014 | .1580842 | 1307 | .0685978 | 6090 | 350 0 50.4 | 40.5 | 0.31 | 72836 |
| 10.0 | .9803054 | 2975 | .1502848 | 3314 | .0652135 | 2252 | 350 30 44.6 | 34.6 | 0.24 | 73426 |
| 10.5 | .9818277 | 8201 | .1424740 | 5208 | .0618244 | 8366 | 351 0 40.3 | 30.2 | 0.18 | 74019 |
| 11 0 | .9832765 | 2693 | .1346524 | 6993 | .0584307 | 4434 | 351 30 34.5 | 24.4 | 0.11 | 74615 |
| 11.5 | .9846517 | 6449 | .1268206 | .8677 | .0550326 | 0458 | 352 0 28.2 | 18.1 | +0.05 | 75215 |
| 12.0 | .9859532 | 9468 | .1189793 | :0265 | .0516303 | 6440 | 352 30 21.5 | 11.3 | −0.02 | 75818 |
| 12.5 | .9871809 | 1749 | .1111290 | 1764 | .0482240 | 2382 | 353 0 14.3 | 4.0 | 0.08 | 76424 |
| 13.0 | .9883348 | 3292 | .1032702 | 3177 | .0448139 | 8286 | 353 29 66.6 | 56.3 | 0.14 | 77034 |
| 13.5 | .9894147 | 4095 | .0954034 | 4511 | .0414004 | 4156 | 353 59 58.5 | 48.1 | 0.19 | 77645 |
| 14.0 | .9904207 | 4159 | .0875292 | 5770 | .0379838 | 9996 | 354 29 49.9 | 39.5 | 0.24 | 78259 |
| 14.5 | .9913526 | 3482 | .0796481 | 6961 | .0345642 | 5805 | 354 59 40.9 | 30.4 | 0.29 | 78876 |
| 15.0 | .9922103 | 2063 | .0717607 | 8088 | .0311417 | 1585 | 355 29 31.5 | 21.0 | 0.33 | 79495 |
| 15.5 | .9929938 | 9902 | .0638676 | 9158 | .0277167 | 7340 | 355 59 21.7 | 11.1 | 0.36 | 80115 |
| 16.0 | .9937030 | 6999 | .0559693 | :0176 | .0242894 | 3072 | 356 29 11.4 | 0.8 | 0.38 | 80737 |
| 16.5 | .9943378 | 3351 | .0480664 | 1148 | .0208601 | 8784 | 356 58 60.7 | 50.0 | 0.40 | 81361 |
| 17.0 | .9948982 | 8959 | .0401595 | 2080 | .0174290 | 4478 | 357 28 49.6 | 38.8 | 0.41 | 81988 |
| 17.5 | .9953841 | 3822 | .0322493 | 2979 | .0139965 | :0158 | 357 58 38.0 | 27.1 | 0.41 | 82615 |
| 18.0 | .9957955 | 7941 | .0243363 | 3850 | .0105627 | 5825 | 358 28 26.0 | 15.1 | 0.40 | 83242 |
| 18 5 | .9961322 | 1312 | .0164211 | 4699 | .0071279 | 1482 | 358 58 13.6 | 2.6 | 0.39 | 83871 |
| 19.0 | .9963943 | 3938 | .0085043 | 5532 | .0036924 | 7132 | 359 27 60.8 | 49.7 | 0.37 | 84501 |
| 19.5 | .9965817 | 5817 | −.0005865 | 6355 | −.0002565 | 2778 | 359 57 47.5 | 36.4 | 0.34 | 85131 |
| 20.0 | .9966945 | 6950 | +.0073316 | 2825 | +.0031796 | 1578 | 0 27 33.8 | 22.7 | 0.30 | 85761 |
| 20.5 | .9967325 | 7334 | .0152495 | 2003 | .0066158 | 5945 | 0 57 19.6 | 8.4 | 0.26 | 86391 |
| 21.0 | .9966958 | 6972 | .0231665 | 1172 | .0100516 | 0288 | 1 26 64.9 | 53.7 | 0.21 | 87021 |
| 21.5 | .9965844 | 5863 | .0310828 | 0326 | .0134867 | 4634 | 1 56 49.8 | 38.5 | 0.16 | 87651 |
| 22.0 | .9963984 | 4008 | .0389952 | 9458 | .0169209 | 8972 | 2 26 34.3 | 22.8 | 0.10 | 88280 |
| 22.5 | .9961376 | 1405 | .0469056 | 8561 | .0203539 | 3297 | 2 56 18.2 | 6.7 | −0.04 | 88909 |
| 23.0 | .9958023 | 8057 | .0548125 | 7629 | .0237855 | 7608 | 3 25 61.6 | 50.1 | +0.02 | 89538 |
| 23.5 | .9953925 | 3964 | .0627155 | 6658 | .0272153 | 1901 | 3 55 44.5 | 32.9 | 0.08 | 90165 |
| 24.0 | .9949081 | 9125 | .0706139 | 5642 | .0306431 | 6175 | 4 25 27.0 | 15.4 | 0.15 | 90792 |
| 24.5 | .9943492 | 3541 | .0785070 | 4572 | .0340687 | 0426 | 4 54 69.0 | 57.3 | 0.22 | 91418 |
| 25.0 | .9937159 | 7213 | .0863944 | 3446 | .0374917 | 4652 | 5 24 50.5 | 38.8 | 0.29 | 92042 |
| 25.5 | .9930083 | 0142 | .0942755 | 2256 | .0409120 | 8850 | 5 54 31.4 | 19.6 | 0.36 | 92664 |
| 26.0 | .9922264 | 2328 | .1021495 | 0996 | .0443292 | 3018 | 6 24 11.8 | 0.0 | 0.42 | 93286 |
| 26.5 | .9913704 | 3773 | .1100158 | :9658 | .0477430 | 7151 | 6 53 51.7 | 39.8 | 0.48 | 93907 |
| 27.0 | .9904404 | 4478 | .1178738 | 8238 | .0511531 | 1248 | 7 23 31.1 | 19.1 | 0.54 | 94527 |
| 27.5 | .9894365 | 4444 | .1257228 | 6728 | .0545593 | 5305 | 7 52 69.9 | 57.8 | 0.59 | 95146 |
| 28.0 | .9883587 | 3672 | .1335621 | 5121 | .0579613 | 9321 | 8 22 48.2 | 36.0 | 0.63 | 95764 |
| 28.5 | .9872073 | 2163 | .1413912 | 3412 | .0613589 | 3292 | 8 52 25.4 | 13.6 | 0.67 | 96381 |
| 29.0 | .9859825 | 9920 | .1492095 | 1594 | .0647518 | 7217 | 9 21 63.0 | 50.7 | 0.71 | 96996 |
| 29.5 | .9846844 | 6944 | .1570164 | :9663 | .0681397 | 1092 | 9 51 39.5 | 27.2 | 0.74 | 97611 |
| 30.0 | .9833132 | 3238 | .1648112 | 7611 | .0715223 | 4914 | 10 21 15.5 | 3.1 | 0.76 | 98225 |
| 30.5 | .9818691 | 8802 | .1725935 | 5434 | .0748994 | 8680 | 10 50 50.9 | 38.5 | 0.77 | 98838 |
| 31.0 | .9803523 | 3640 | .1803626 | 3125 | .0782707 | 2389 | 11 20 25.6 | 43.2 | 0.78 | 99451 |
| 31.5 | .9787629 | 7752 | .1881180 | 0679 | .0816361 | 6039 | 11 49 59.8 | 47.3 | 0.78 | ◆00064 |
| Apr. 1.0 | .9771011 | 1140 | .1958591 | 8090 | .0849952 | 9626 | 12 19 33.5 | 20.9 | 0.77 | 00676 |
| 1.5 | .9753672 | 3806 | .2035854 | 5353 | .0883479 | 3148 | 12 48 66.5 | 53.8 | 0.75 | 01287 |
| 2.0 | +.9735613 | 5753 | +.2112964 | 2463 | +.0916939 | 6604 | 13 18 38.9 | 26.2 | +0.73 | 01898 |

◆ The first figures of this and the following logarithms are 0.00

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ=☉'s True Longitude. | λ′ | β=☉'s Latitude. | Log. Rad. Vect. = ρ. |
| Apr. 2.5 | +.9716837 | 6983 | +.2189914 | 9413 | +.0950330 | :9991 | 13° 47′ 70″.8 | 58″.1 | +0″.69 | 0.00<br>02510 |
| 3.0 | .9697345 | 7497 | .2266700 | 6199 | .0983648 | 3306 | 14 17 42.2 | 29.4 | 0.65 | 03122 |
| 3.5 | .9677139 | 7297 | .2343316 | 2815 | .1016892 | 6545 | 14 47 13.0 | 0.1 | 0.61 | 03734 |
| 4.0 | .9656222 | 6386 | .2419756 | 9256 | .1050060 | :9709 | 15 16 43.1 | 30.2 | 0.56 | 04346 |
| 4.5 | .9634596 | 4766 | .2496016 | 5516 | .1083150 | 2795 | 15 45 72.7 | 59.7 | 0.51 | 04958 |
| 5.0 | .9612262 | 2438 | .2572091 | 1591 | .1116159 | 5800 | 16 15 41.8 | 28.7 | 0.45 | 05571 |
| 5.5 | .9589224 | 9406 | .2647973 | 7475 | .1149085 | 8722 | 16 44 70.3 | 57.2 | 0.39 | 06185 |
| 6.0 | .9565482 | 5670 | .2723663 | 3163 | .1181927 | 1560 | 17 14 38.3 | 25.2 | 0.33 | 06800 |
| 6.5 | .9541039 | 1233 | .2799149 | 8649 | .1214682 | 4311 | 17 43 65.7 | 52.6 | 0.27 | 07415 |
| 7.0 | .9515898 | 6098 | .2874430 | 3931 | .1247346 | 6971 | 18 13 32.6 | 19.4 | 0.20 | 08030 |
| 7.5 | .9490062 | 0268 | .2949500 | 9001 | .1279918 | 9539 | 18 42 59.0 | 45.7 | 0.14 | 08647 |
| 8.0 | .9463533 | 3745 | .3024352 | 3853 | .1312395 | 2012 | 19 12 24.9 | 11.5 | 0.07 | 09265 |
| 8.5 | .9436312 | 6530 | .3098982 | 8484 | .1344776 | 4389 | 19 41 50.2 | 36.8 | +0.01 | 09882 |
| 9.0 | .9408402 | 8627 | .3173386 | 2889 | .1377059 | 6669 | 20 11 15.0 | 1.6 | −0.05 | 10500 |
| 9.5 | .9379805 | :0036 | .3247558 | 7061 | .1409242 | 8848 | 20 40 39.3 | 25.8 | 0.10 | 11119 |
| 10.0 | .9350523 | 0760 | .3321493 | 0997 | .1441322 | 0924 | 21 9 63.1 | 49.6 | 0.15 | 11738 |
| 10.5 | .9320558 | 0801 | .3395186 | 4691 | .1473298 | 2896 | 21 39 26.4 | 12.9 | 0.20 | 12358 |
| 11.0 | .9289912 | :0162 | .3468633 | 8139 | .1505167 | 4762 | 22 8 49.3 | 35.7 | 0.25 | 12978 |
| 11.5 | .9258587 | 8843 | .3541830 | 1336 | .1536928 | 6519 | 22 37 71.8 | 58.1 | 0.28 | 13598 |
| 12.0 | .9226586 | 6849 | .3614771 | 4278 | .1568579 | 8167 | 23 7 33.8 | 20.1 | 0.31 | 14218 |
| 12.5 | .9193909 | 4178 | .3687453 | 6961 | .1600117 | :9701 | 23 36 55.4 | 41.7 | 0.33 | 14838 |
| 13.0 | .9160560 | 0836 | .3759868 | 9377 | .1631541 | 1122 | 24 6 16.6 | 2.8 | 0.34 | 15457 |
| 13.5 | .9126542 | 6824 | .3832012 | 1522 | .1662847 | 2424 | 24 35 37.3 | 23.5 | 0.34 | 16076 |
| 14.0 | .9091856 | 2145 | .3903879 | 3390 | .1694032 | 3606 | 25 4 57.5 | 43.7 | 0.34 | 16695 |
| 14.5 | .9056505 | 6801 | .3975463 | 4975 | .1725095 | 4665 | 25 34 17.4 | 3.5 | 0.33 | 17313 |
| 15.0 | .9020491 | 0794 | .4046758 | 6271 | .1756033 | 5600 | 26 3 36.9 | 22.8 | 0.31 | 17930 |
| 15.5 | .8983818 | 4127 | .4117760 | 7274 | .1786845 | 6408 | 26 32 55.9 | 41.7 | 0.29 | 18546 |
| 16.0 | .8946486 | 6802 | .4188465 | 7980 | .1817528 | 7088 | 27 2 14.4 | 0.2 | 0.26 | 19160 |
| 16.5 | .8908499 | 8822 | .4258867 | 8363 | .1848080 | 7637 | 27 31 32.6 | 18.4 | 0.22 | 19772 |
| 17.0 | .8869861 | :0191 | .4328961 | 8479 | .1878499 | 8053 | 28 0 50.4 | 36.1 | 0.18 | 20383 |
| 17.5 | .8830573 | 0910 | .4398743 | 8262 | .1908782 | 8333 | 28 29 67.7 | 53.4 | 0.13 | 20992 |
| 18.0 | .8790639 | 0983 | .4468206 | 7726 | .1938926 | 8474 | 28 59 24.6 | 10.2 | 0.08 | 21599 |
| 18.5 | .8750060 | 0411 | .4537344 | 6865 | .1968931 | 8476 | 29 28 41.1 | 26.6 | −0.02 | 22203 |
| 19.0 | .8708840 | 9198 | .4606154 | 5677 | .1998796 | 8336 | 29 57 57.2 | 42.6 | +0.04 | 22805 |
| 19.5 | .8666982 | 7347 | .4674631 | 4155 | .2028512 | 8051 | 30 26 72.9 | 58.2 | 0.10 | 23404 |
| 20.0 | .8624490 | 4862 | .4742768 | 2294 | .2058083 | 7619 | 30 56 28.1 | 13.4 | 0.17 | 24001 |
| 20.5 | .8581366 | 1745 | .4810561 | 0088 | .2087504 | 7037 | 31 25 42.9 | 28.1 | 0.24 | 24593 |
| 21.0 | .8537613 | 7999 | .4878003 | 7532 | .2116773 | 6304 | 31 54 57.3 | 42.4 | 0.31 | 25182 |
| 21.5 | .8493236 | 3629 | .4945089 | 4619 | .2145888 | 5416 | 32 23 71.2 | 56.3 | 0.38 | 25768 |
| 22.0 | .8448236 | 8636 | .5011815 | 1347 | .2174846 | 4372 | 32 53 24.7 | 9.7 | 0.44 | 26351 |
| 22.5 | .8402618 | 3022 | .5078176 | 7709 | .2203646 | 3169 | 33 22 37.7 | 22.7 | 0.50 | 26930 |
| 23.0 | .8356387 | 6801 | .5144167 | 3703 | .2232285 | 1806 | 33 51 50.3 | 35.2 | 0.55 | 27505 |
| 23.5 | .8309545 | 9966 | .5209784 | 9322 | .2260761 | 0279 | 34 20 62.5 | 47.3 | 0.60 | 28077 |
| 24.0 | .8262097 | 2525 | .5275022 | 4562 | .2289072 | 8588 | 34 49 74.2 | 59.9 | 0.65 | 28645 |
| 24.5 | .8214046 | 4482 | .5339875 | 9417 | .2317216 | 6729 | 35 19 25.4 | 10.0 | 0.69 | 29209 |
| 25.0 | .8165397 | 5840 | .5404337 | 3881 | .2345190 | 4701 | 35 48 36.2 | 20.7 | 0.73 | 29770 |
| 25.5 | .8116154 | 6604 | .5468403 | 7949 | .2372992 | 2500 | 36 17 46.5 | 30.9 | 0.76 | 30327 |
| 26.0 | .8066321 | 6778 | .5532069 | 1617 | .2400620 | 0126 | 36 46 56.2 | 40.6 | 0.78 | 30880 |
| 26.5 | .8015902 | 6366 | .5595331 | 4881 | .2428073 | 7577 | 37 15 65.5 | 49.8 | 0 80 | 31429 |
| 27.0 | .7964902 | 5374 | .5658185 | 7737 | .2455348 | 4850 | 37 44 74.3 | 58.6 | 0.81 | 31975 |
| 27.5 | .7913326 | 3805 | .5720626 | 0180 | .2482444 | 1944 | 38 14 22.6 | 6.9 | 0.81 | 32518 |
| 28.0 | .7861178 | 1664 | .5782650 | 2206 | .2509358 | 8856 | 38 43 30.4 | 14.6 | 0.80 | 33057 |
| 28.5 | .7808462 | 8955 | .5944252 | 3810 | .2536089 | 5584 | 39 12 37.6 | 21.7 | 0.78 | 33593 |
| 29.0 | .7755182 | 5683 | .5905427 | 4988 | .2562634 | 2128 | 39 41 44.3 | 28.3 | 0.75 | 34126 |
| 29.5 | .7701343 | 1851 | .5966172 | 5735 | .2588991 | 8483 | 40 10 50.6 | 34.5 | 0.72 | 34656 |
| 30.0 | .7646950 | 7466 | .6026483 | 6049 | .2615159 | 4649 | 40 39 56.4 | 40.2 | 0.69 | 35182 |
| 30.5 | .7592007 | 2530 | .6086357 | 5925 | .2641138 | 0626 | 41 8 61.6 | 45.4 | 0.65 | 35707 |
| May 1.0 | .7536519 | 7050 | .6145789 | 5360 | .2666925 | 6411 | 41 37 66.3 | 50.1 | 0.60 | 36229 |
| 1.5 | .7480489 | 1027 | .6204775 | 4345 | .2692518 | 2002 | 42 36 70.6 | 54.3 | 0.55 | 36747 |
| 2.0 | .7423923 | 4469 | .6263312 | 2888 | .2717915 | 7398 | 42 35 74.4 | 58.0 | 0.49 | 37262 |
| 2.5 | +.7366825 | 7378 | +.6321396 | 0975 | +.2743116 | 2597 | 43 5 17.7 | 1.2 | +0.43 | 37776 |

NOTE.—: denotes a change in the preceding figure.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ=☉'s True Longitude. | λ′ | β=☉'s Latitude. | Log. Rad. Vect.=ρ. |
| May 3.0 | +.7309200 | 9761 | +.6379022 | 8604 | +.2768120 | 7600 | 43° 34′ 20″.5 | 3″.9 | +0″.36 | 0.00<br>38288 |
| 3.5 | .7251053 | 1621 | .6436188 | 5772 | .2792924 | 2402 | 44 3 22.8 | 6.1 | 0.30 | 38797 |
| 4.0 | .7192388 | 2964 | .6492890 | 2477 | .2817525 | 7002 | 44 32 24.6 | 7.8 | 0.23 | 39304 |
| 4.5 | .7133208 | 3792 | .6549124 | 8734 | .2841924 | 1399 | 45 1 26.0 | 9.1 | 0.17 | 39810 |
| 5.0 | .7073519 | 4111 | .6604887 | 4480 | .2866118 | 5592 | 45 30 27.0 | 10.0 | 0.10 | 40314 |
| 5.5 | .7013325 | 3925 | .6660176 | :9772 | .2890106 | 9579 | 45 59 27.4 | 10.4 | +0.04 | 40816 |
| 6.0 | .6952631 | 3238 | .6714987 | 4586 | .2913886 | 3358 | 46 28 27.3 | 10.3 | −0.02 | 41316 |
| 6.5 | .6891441 | 2056 | .6769315 | 8917 | .2937457 | 6928 | 46 57 26.9 | 9.8 | 0.08 | 41814 |
| 7.0 | .6829759 | :0382 | .6823158 | 2764 | .2960817 | 0287 | 47 26 26.1 | 8.9 | 0.14 | 42310 |
| 7.5 | .6767589 | 8220 | .6876512 | 6121 | .2983966 | 3435 | 47 55 24.8 | 7.5 | 0.19 | 42804 |
| 8.0 | .6704936 | 5574 | .6929375 | 8987 | .3006902 | 6370 | 48 24 23.1 | 5.7 | 0.24 | 43297 |
| 8.5 | .6641804 | 2450 | .6981745 | 1360 | .3029625 | 9092 | 48 53 21.1 | 3.6 | 0.28 | 43788 |
| 9.0 | .6578197 | 8851 | .7033617 | 3236 | .3052132 | 1598 | 49 22 18.7 | 1.1 | 0.31 | 44278 |
| 9.5 | .6514120 | 4782 | .7084989 | 4611 | .3074423 | 3888 | 49 50 75.9 | 58.2 | 0.33 | 44766 |
| 10.0 | .6449577 | :0247 | .7135857 | 5483 | .3096495 | 5960 | 50 19 72.7 | 54.9 | 0.35 | 45252 |
| 10.5 | .6384573 | 5251 | .7186216 | 5846 | .3118347 | 7811 | 50 48 69.2 | 51.4 | 0.35 | 45735 |
| 11.0 | .6319113 | 9799 | .7236063 | 5697 | .3139978 | 9442 | 51 17 65.4 | 47.5 | 0.35 | 46217 |
| 11.5 | .6253200 | 3894 | .7285394 | 5031 | .3161385 | 0848 | 51 46 61.2 | 43.3 | 0.34 | 46697 |
| 12.0 | .6186839 | 7541 | .7334205 | 3846 | .3182566 | 2029 | 52 15 56.6 | 38.6 | 0.33 | 47174 |
| 12.5 | .6120034 | 0744 | .7382494 | 2139 | .3203521 | 2983 | 52 44 51.8 | 33.7 | 0.31 | 47649 |
| 13.0 | .6052790 | 3507 | .7430258 | :9907 | .3224249 | 3711 | 53 13 46.7 | 28.5 | 0.28 | 48121 |
| 13.5 | .5985111 | 5836 | .7477494 | 7147 | .3244748 | 4209 | 53 42 41.2 | 22.9 | 0.25 | 48591 |
| 14.0 | .5917002 | 7735 | .7524199 | 3856 | .3265016 | 4477 | 54 11 35.4 | 17.0 | 0.21 | 49057 |
| 14.5 | .5848467 | 9208 | .7570370 | 0031 | .3285052 | 4513 | 54 40 29.4 | 10.9 | 0.16 | 49528 |
| 15.0 | .5779511 | :0259 | .7616002 | 5667 | .3304853 | 4314 | 55 9 23.1 | 4.5 | 0.11 | 49980 |
| 15.5 | .5710138 | 0894 | .7661093 | 0762 | .3324420 | 3881 | 55 37 76.5 | 57.9 | −0.05 | 50437 |
| 16.0 | .5640354 | 1118 | .7705639 | 5313 | .3343751 | 3212 | 56 6 69.6 | 50.9 | +0.01 | 50890 |
| 16.5 | .5570164 | 0936 | .7749634 | 9312 | .3362845 | 2306 | 56 35 62.4 | 43.7 | 0.07 | 51338 |
| 17.0 | .5499572 | :0351 | .7793076 | 2759 | .3381701 | 1162 | 57 4 55.0 | 36.2 | 0.14 | 51782 |
| 17.5 | .5428583 | 9370 | .7835962 | 5649 | .3400316 | :9777 | 57 33 47.3 | 28.4 | 0.20 | 52222 |
| 18.0 | .5357203 | 7998 | .7878290 | 7982 | .3418689 | 8150 | 58 2 39.3 | 20.3 | 0.27 | 52658 |
| 18.5 | .5285436 | 6239 | .7920057 | :9754 | .3436819 | 6280 | 58 31 31.0 | 11.9 | 0.34 | 53089 |
| 19.0 | .5213288 | 4098 | .7961259 | 0960 | .3454703 | 4165 | 59 0 22.4 | 3.2 | 0.40 | 53515 |
| 19.5 | .5140764 | 1582 | .8001893 | 1600 | .3472339 | 1801 | 59 28 73.6 | 54.3 | 0.46 | 53937 |
| 20.0 | .5067871 | 8697 | .8041956 | 1668 | .3489725 | 9188 | 59 57 64.6 | 45.2 | 0.51 | 54354 |
| 20.5 | .4994613 | 5447 | .8081444 | 1161 | .3506862 | 6325 | 60 26 55.3 | 35.8 | 0.57 | 54763 |
| 21.0 | .4920995 | 1836 | .8120353 | 0075 | .3523748 | 3212 | 60 55 45.6 | 26.1 | 0.62 | 55168 |
| 21.5 | .4847025 | 7874 | .8158681 | 8408 | .3540381 | :9845 | 61 24 35.6 | 16.1 | 0.67 | 55568 |
| 22.0 | .4772708 | 3565 | .8196425 | 6157 | .3556760 | 6225 | 61 53 25.3 | 5.7 | 0.70 | 55963 |
| 22.5 | .4698048 | 8913 | .8233582 | 3319 | .3572885 | 2351 | 62 21 74.7 | 55.0 | 0.72 | 56351 |
| 23.0 | .4623052 | 3924 | .8270149 | :9892 | .3588753 | 8220 | 62 50 63.8 | 43.9 | 0.74 | 56734 |
| 23.5 | .4547726 | 8606 | .8306124 | 5872 | .3604364 | 3832 | 63 19 52.6 | 32.6 | 0.76 | 57111 |
| 24.0 | .4472076 | 2964 | .8341505 | 1259 | .3619717 | 9186 | 63 48 41.1 | 21.0 | 0.77 | 57483 |
| 24.5 | .4396106 | 7002 | .8376290 | 6050 | .3634811 | 4281 | 64 17 29.2 | 9.0 | 0.77 | 57849 |
| 25.0 | .4319822 | :0725 | .8410477 | 0243 | .3349645 | 9116 | 64 45 77.0 | 56.8 | 0.77 | 58210 |
| 25.5 | .4243232 | 4143 | .8444062 | 3833 | .3664218 | 3690 | 65 14 64.6 | 44.3 | 0.76 | 58565 |
| 26.0 | .4166341 | 7259 | .8477045 | 6822 | .3678529 | 8002 | 65 43 51.9 | 31.5 | 0.74 | 58914 |
| 26.5 | .4089155 | :0081 | .8509422 | 9205 | .3692577 | 2051 | 66 12 38.8 | 18.3 | 0.71 | 59258 |
| 27.0 | .4011679 | 2612 | .8541191 | 0980 | .3706360 | 5836 | 66 41 25.3 | 4.7 | 0.67 | 59597 |
| 27.5 | .3933919 | 4860 | .8572350 | 2145 | .3719879 | 9356 | 67 9 71.5 | 50.8 | 0.63 | 59931 |
| 28.0 | .3855883 | 6831 | .8602897 | 2698 | .3733133 | 2611 | 67 38 57.4 | 36.6 | 0.59 | 60260 |
| 28.5 | .3777576 | 8532 | .8632830 | 2637 | .3746120 | 5600 | 68 7 43.0 | 22.1 | 0.53 | 60584 |
| 29.0 | .3699003 | 9966 | .8662149 | 1963 | .3758839 | 8321 | 68 36 28.2 | 7.2 | 0.47 | 60903 |
| 29.5 | .3620172 | 1143 | .8690852 | .0672 | .3771290 | 0773 | 69 4 73.1 | 52.0 | 0.41 | 61217 |
| 30.0 | .3541088 | 2066 | .8718937 | 8764 | .3783473 | 2958 | 69 33 57.6 | 36.5 | 0.35 | 61526 |
| 30.5 | .3461757 | 2742 | .8746401 | 6235 | .3795387 | 4874 | 70 2 41.9 | 20.7 | 0.29 | 61831 |
| 31.0 | .3382184 | 3176 | .8773244 | 3084 | .3807031 | 6520 | 70 31 25.8 | 4.5 | 0.22 | 62132 |
| 31.5 | .3302376 | 3376 | .8799466 | 9312 | .3818405 | 7895 | 70 59 69.4 | 48.0 | 0.15 | 62428 |
| June 1.0 | .3222338 | 3345 | .8825064 | 4917 | .3829509 | 9001 | 71 28 52.7 | 31.2 | 0.08 | 62719 |
| 1.5 | .3142077 | 3091 | .8850038 | :9898 | .3840342 | :9836 | 71 57 35.7 | 14.1 | +0.01 | 63008 |
| 2.0 | +.3061597 | 2618 | +.8874386 | 4253 | +.3850904 | 0400 | 72 25 78.4 | 56.7 | −0.05 | 63293 |

NOTE.—The accented letters correspond to the mean equinox and equator of Jan. 0d.0.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X'. | Y. | Y'. | Z. | Z'. | λ = ☉'s True Longitude. | λ′ | β = ☉'s Latitude. | Log. Rad. Vect. = ρ. |
| June 2.5 | +.2980903 | 1932 | +.8898107 | 7981 | +.3861194 | 0692 | 72° 54′ 60″.8 | 39″.0 | −0″.11 | 0.00<br>63574 |
| 3.0 | .2900002 | 1038 | .8921200 | 1081 | .3871212 | 0712 | 73 23 42.9 | 21.0 | 0.17 | 63852 |
| 3.5 | .2818900 | 9943 | .8943665 | 3553 | .3880957 | 0459 | 73 52 24.7 | 2.7 | 0.22 | 64127 |
| 4.0 | .2737602 | 8652 | .8965499 | 5394 | .3890429 | :9934 | 74 20 66.3 | 44.2 | 0.26 | 64399 |
| 4.5 | .2656112 | 7169 | .8986700 | 6602 | .2899627 | 9134 | 74 49 47.6 | 25.4 | 0.30 | 64667 |
| 5.0 | .2574437 | 5501 | .9007266 | 7175 | .3908550 | 8059 | 75 18 28.7 | 6.4 | 0.34 | 64931 |
| 5.5 | .2492583 | 3654 | .9027197 | 7113 | .3917197 | 6708 | 75 46 69.5 | 47.1 | 0.37 | 65192 |
| 6.0 | .2410555 | 1632 | .9046492 | 6416 | .3925568 | 5082 | 76 15 50.1 | 27.6 | 0.39 | 65449 |
| 6.5 | .2328357 | 9441 | .9065151 | 5082 | .3933664 | 3180 | 76 44 30.4 | 7.8 | 0.40 | 65703 |
| 7.0 | .2245995 | 6996 | .9083173 | 3112 | .3941483 | 1002 | 77 12 70.6 | 47.9 | 0.41 | 65953 |
| 7.5 | .2163475 | 4573 | .9100557 | 0503 | .3949026 | 8548 | 77 41 50.6 | 27.8 | 0.41 | 66201 |
| 8.0 | .2080801 | 1905 | .9117302 | 7256 | .3956292 | 5817 | 78 10 30.5 | 7.6 | 0.40 | 66446 |
| 8.5 | .1997979 | 9090 | .9133408 | 3370 | .3963281 | 2808 | 78 38 70.2 | 47.2 | 0.38 | 66688 |
| 9.0 | .1915014 | 6131 | .9148872 | 8842 | .3969992 | 9522 | 79 7 49.7 | 26.6 | 0.36 | 66926 |
| 9.5 | .1831912 | 3036 | .9163694 | 3672 | .3976425 | 5958 | 79 36 29.2 | 6.0 | 0.32 | 67160 |
| 10.0 | .1748679 | 9809 | .9177872 | 7858 | .3982579 | 2115 | 80 4 68.5 | 45.2 | 0.28 | 67391 |
| 10.5 | .1665320 | 6457 | .9191403 | 1397 | .3988454 | 7993 | 80 33 47.6 | 24.2 | 0.24 | 67619 |
| 11.0 | .1581841 | 2985 | .9204287 | 4289 | .3994048 | 3590 | 81 2 26.6 | 3.1 | 0.19 | 67842 |
| 11.5 | .1498247 | 9396 | .9216525 | 6535 | .3999361 | 8906 | 81 30 65.6 | 42.0 | 0.14 | 68061 |
| 12.0 | .1414544 | 5699 | .9228115 | 8133 | .4004394 | 3943 | 81 59 44.4 | 20.7 | 0.08 | 68276 |
| 12.5 | .1330738 | 1899 | .9239055 | 9081 | .4009144 | 8696 | 82 27 83.1 | 59.3 | −0.02 | 68488 |
| 13.0 | .1246835 | 8002 | .9249344 | 9379 | .4013612 | 3167 | 82 56 61.7 | 37.8 | +0.04 | 68695 |
| 13.5 | .1162841 | 4014 | .9258981 | 9024 | .4017797 | 7355 | 83 25 40.3 | 16.3 | 0.11 | 68896 |
| 14.0 | .1078761 | 9940 | .4267966 | 8018 | .4021698 | 1260 | 83 53 78.8 | 54.7 | 0.17 | 69093 |
| 14.5 | .0994601 | 5786 | .9276298 | 6358 | .4025317 | 4882 | 84 22 57.2 | 33.0 | 0.23 | 69286 |
| 15.0 | .0910368 | 1559 | .9283975 | 4044 | .4028651 | 8220 | 84 51 35.5 | 11.2 | 0.29 | 69473 |
| 15.5 | .0826067 | 7264 | .9290997 | 1075 | .4031701 | 1274 | 85 19 73.7 | 49.3 | 0.36 | 69654 |
| 16.0 | .0741703 | 2905 | .9297364 | 7451 | .4034467 | 4044 | 85 48 51.9 | 27.4 | 0.42 | 69830 |
| 16.5 | .0657284 | 8492 | .9303073 | 3169 | .4036948 | 6528 | 86 17 30.0 | 5.4 | 0.48 | 70001 |
| 17.0 | .0572816 | 4029 | .9308125 | 8230 | .4039144 | 8728 | 86 45 68.0 | 43.3 | 0.53 | 70166 |
| 17.5 | .0488304 | 9522 | .9312520 | 2634 | .4041054 | 0642 | 87 14 46.0 | 21.2 | 0.58 | 70325 |
| 18.0 | .0403754 | 4977 | .9316256 | 6379 | .4042677 | 2269 | 87 42 83.9 | 59.0 | 0.62 | 70478 |
| 18.5 | .0319172 | :0400 | .9319331 | 9463 | .4044013 | 3609 | 88 11 61.7 | 36.7 | 0.65 | 70625 |
| 19.0 | .0234566 | 5799 | .9321746 | 1887 | .4045062 | 4662 | 88 40 39.5 | 14.4 | 0.68 | 70765 |
| 19.5 | .0149941 | :1179 | .9323501 | 3851 | .4045824 | 5428 | 89 8 77.3 | 52.1 | 0.69 | 70898 |
| 20.0 | +.0065303 | 6546 | .9324596 | 4756 | .4046300 | 5908 | 89 37 55.0 | 29.7 | 0.70 | 71025 |
| 20.5 | −.0019340 | 8092 | .9325032 | 5201 | .4046489 | 6101 | 90 6 32.6 | 7.2 | 0.70 | 71147 |
| 21.0 | .0103983 | 2730 | .9324808 | 4987 | .4046392 | 6004 | 90 34 70.0 | 44.5 | 0.70 | 71262 |
| 21.5 | .0188619 | 7361 | .9323924 | 4113 | .4046007 | 5627 | 91 3 47.4 | 21.8 | 0.68 | 71370 |
| 22.0 | .0273242 | 2980 | .9322380 | 2579 | .4045335 | 4960 | 91 31 84.7 | 59.0 | 0.66 | 71471 |
| 22.5 | .0357845 | 6578 | .9320175 | 0383 | .4044376 | 4005 | 92 0 61.9 | 36.1 | 0.64 | 71566 |
| 23.0 | .0442421 | 1150 | .9317310 | 7528 | .4043131 | 2765 | 92 29 39.1 | 13.2 | 0.61 | 71654 |
| 23.5 | .0526964 | 5689 | .9313783 | 4011 | .4041599 | 1237 | 92 57 76.1 | 50.1 | 0.57 | 71736 |
| 24.0 | .0611468 | 0189 | .9309596 | 9834 | .4039780 | 9423 | 93 26 53.0 | 26.9 | 0.52 | 71811 |
| 24.5 | .0695925 | 4642 | .9304750 | 4998 | .4037676 | 7323 | 93 55 29.8 | 3.6 | 0.47 | 71879 |
| 25.0 | .0780331 | :9044 | .9299247 | 9505 | .4035286 | 4938 | 94 23 66.6 | 40.3 | 0.42 | 71940 |
| 25.5 | .0864678 | 3387 | .9293089 | 3257 | .4032611 | 2267 | 94 52 43.2 | 16.8 | 0.36 | 71996 |
| 26.0 | .0948960 | 7665 | .9286275 | 6554 | .4029650 | 9311 | 95 20 79.7 | 53.2 | 0.30 | 72046 |
| 26.5 | .1033172 | 2873 | .9278807 | 9096 | .4026405 | 6070 | 95 49 56.1 | 29.5 | 0.24 | 72090 |
| 27.0 | .1117308 | 6006 | .9270685 | 0985 | .4022876 | 2546 | 96 18 32.4 | 5.7 | 0.17 | 72129 |
| 27.5 | .1201360 | 0054 | .9261909 | 2219 | .4019063 | 8738 | 96 46 68.5 | 40.7 | 0.10 | 72162 |
| 28.0 | .1285323 | 4014 | .9252479 | 2800 | .4014967 | 4647 | 97 15 44.6 | 17.7 | +0.03 | 72190 |
| 28.5 | .1369192 | 7879 | .9242397 | 2728 | .4010589 | 0274 | 97 43 80.6 | 53.6 | −0.04 | 72212 |
| 29.0 | .1452961 | 1645 | .9231664 | 2006 | .4005929 | 5619 | 98 12 56.5 | 29.5 | 0.10 | 72228 |
| 29.5 | .1536625 | 5306 | .9220283 | 0635 | .4000989 | 0684 | 98 41 32.3 | 5.2 | 0.16 | 72240 |
| 30.0 | .1620177 | :8855 | .9208255 | 8618 | .3995768 | 5468 | 99 9 68.0 | 40.8 | 0.22 | 72248 |
| 30.5 | .1703612 | 2287 | .9195581 | 5954 | .3990267 | :9972 | 99 38 43.6 | 16.3 | 0.27 | 72251 |
| July 1.0 | .1786924 | 5596 | .9182262 | 2646 | .3984485 | 4195 | 100 6 79.1 | 51.7 | 0.32 | 72249 |
| 1.5 | .1870106 | :8775 | .9168299 | 8694 | .3978424 | 8139 | 100 35 54.6 | 27.1 | 0.36 | 72242 |
| 2.0 | .1953154 | 1821 | .9153693 | 4099 | .3972083 | 1804 | 101 4 30.0 | 2.4 | 0.40 | 72232 |
| 2.5 | −.2036063 | 4727 | +.9138446 | 8863 | +.3965464 | 5190 | 101 32 65.3 | 37.6 | −0.43 | 72217 |

**Note.**— : denotes a change in the preceding figure.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ=☉'s True Longitude. | λ′ | β=☉'s Latitude. | Log. Rad. Vect.=ρ. |
| July 3.0 | −.2118827 | 7489 | +.9122558 | 2986 | +.3958567 | 8298 | 102° 1′ 40″.6 | 12″.8 | −0″.46 | 0.00<br>72198 |
| 3.5 | .2201439 | 0099 | .9106031 | 6470 | .3951394 | 1130 | 102 29 75.9 | 48.1 | 0.48 | 72175 |
| 4.0 | .2283894 | 2552 | .9088868 | 9318 | .3943945 | 3687 | 102 58 51.2 | 23.3 | 0.49 | 72149 |
| 4.5 | .2366188 | 4845 | .9071069 | 1530 | .3936221 | 5968 | 103 26 86.5 | 58.5 | 0.49 | 72119 |
| 5.0 | .2448316 | 6971 | .9052635 | 3107 | .3928223 | 7976 | 103 55 61.8 | 33.6 | 0.49 | 72085 |
| 5.5 | 2530272 | :8925 | .9033567 | 4050 | .3919950 | 9708 | 104 24 37.1 | 8.8 | 0.47 | 72048 |
| 6.0 | .2612050 | 0702 | .9013867 | 4361 | .3911403 | 1167 | 104 52 72.4 | 44.0 | 0.45 | 72007 |
| 6.5 | .2693645 | 22[illegible]4 | .8993535 | 4040 | .3902582 | 2351 | 105 21 47.7 | 19.2 | 0.42 | 71962 |
| 7.0 | .2775052 | 3701 | .8972573 | 3089 | .3893488 | 3263 | 105 49 83.0 | 54.4 | 0.39 | 71913 |
| 7.5 | .2856265 | 4912 | .8950983 | 1510 | .3884122 | 3903 | 106 18 58.4 | 29.7 | 0.34 | 71861 |
| 8.0 | .2937279 | 5925 | .8928766 | 9304 | .3874484 | 4271 | 106 47 33.9 | 5.1 | 0.29 | 71806 |
| 8.5 | .3018088 | 6733 | .8905924 | 6473 | .3864575 | 4368 | 107 15 69.5 | 40.7 | 0.24 | 71746 |
| 9.0 | .3098689 | 7333 | .8882457 | 3017 | .3854396 | 4194 | 107 44 45.2 | 16.3 | 0.19 | 71683 |
| 9.5 | .3179075 | 7718 | .8858366 | 8937 | .3843946 | 3750 | 108 12 81.0 | 52.0 | 0.13 | 71616 |
| 10.0 | .3259240 | 7883 | .8833653 | 4236 | .3833225 | 3035 | 108 41 56.9 | 27.8 | 0.07 | 71545 |
| 10.5 | .3339179 | 7821 | .8808319 | 8913 | .3822234 | 2050 | 109 10 32.9 | 3.7 | −0.01 | 71470 |
| 11.0 | .3418888 | 7530 | .8782364 | 2969 | .3810975 | 0797 | 109 38 69.0 | 39.7 | +0.05 | 71390 |
| 11.5 | .3498360 | 7002 | .8755792 | 6408 | .3799448 | 9276 | 110 7 45.3 | 15.9 | 0.12 | 71305 |
| 12.0 | .3577589 | 6231 | .8728604 | 9232 | .3787654 | 7488 | 110 35 81.7 | 52.2 | 0.18 | 71216 |
| 12.5 | .3656570 | 5212 | .8700801 | 1440 | .3775593 | 5433 | 111 4 58.2 | 28.7 | 0.24 | 71123 |
| 13.0 | .3735298 | 3941 | .8672386 | 3037 | .3763266 | 3112 | 111 33 35.0 | 5.3 | 0.30 | 71026 |
| 13.5 | .3813767 | 2410 | .8643360 | 4022 | .3750673 | 0525 | 112 1 71.9 | 42.1 | 0.36 | 70924 |
| 14.0 | .3891971 | 0615 | .8613723 | 4397 | .3737815 | 7674 | 112 30 48.9 | 19.1 | 0.41 | 70816 |
| 14.5 | .3969904 | 8548 | .8583477 | 4162 | .3724693 | 4558 | 112 58 86.1 | 56.2 | 0.46 | 70703 |
| 15.0 | .4047561 | 6206 | .8552624 | 3321 | .3711307 | 1178 | 113 27 63.5 | 33.5 | 0.50 | 70584 |
| 15.5 | .4124935 | 3581 | .8521165 | 1873 | .3697658 | 7535 | 113 56 41.1 | 11.0 | 0.54 | 70460 |
| 16.0 | .4202021 | 0668 | .8489102 | 9822 | .3683747 | 3631 | 114 24 78.8 | 48.6 | 0.57 | 70330 |
| 16.5 | .4278813 | 7461 | .8456438 | 7169 | .3669576 | 9466 | 114 53 56.7 | 26.4 | 0.59 | 70195 |
| 17.0 | .4355304 | 3954 | .8423175 | 3918 | .3655143 | 5040 | 115 22 34.8 | 4.4 | 0.61 | 70053 |
| 17.5 | .4431490 | 0141 | .8389315 | :0069 | .3640450 | 0353 | 115 50 73.0 | 42.5 | 0.61 | 69905 |
| 18.0 | .4507366 | 6017 | .8354860 | 5626 | .3625498 | 5408 | 116 19 51.4 | 20.8 | 0.61 | 69751 |
| 18.5 | .4582920 | 1575 | .8319813 | :0590 | .3610289 | 0205 | 116 47 90.0 | 59.4 | 0.60 | 69591 |
| 19.0 | .4658153 | 6810 | .8284176 | 4965 | .3594825 | 4748 | 117 16 68.7 | 38.0 | 0.59 | 69424 |
| 19.5 | .4733058 | 1717 | .8247951 | 8751 | .3579105 | 9034 | 117 45 47.6 | 16.8 | 0.56 | 69251 |
| 20.0 | .4807628 | 6289 | .8211140 | 1952 | .3563130 | 3066 | 118 13 86.6 | 55.7 | 0.53 | 69072 |
| 20.5 | .4881856 | 0519 | .8173746 | 4569 | .3546902 | 6844 | 118 42 65.8 | 34.8 | 0.50 | 68886 |
| 21.0 | .4955738 | 4404 | .8135772 | 6607 | .3530422 | 0371 | 119 11 45.2 | 14.1 | 0.46 | 68694 |
| 21.5 | .5029270 | 7938 | .8097221 | 8067 | .3513691 | 3646 | 119 39 84.8 | 53.6 | 0.41 | 68495 |
| 22.0 | .5102444 | 1115 | .8058096 | 8954 | .3496711 | 6673 | 120 8 64.4 | 33.1 | 0.35 | 68290 |
| 22.5 | .5175255 | 3929 | .8018399 | 9268 | .3479483 | 9451 | 120 37 44.2 | 12.8 | 0.29 | 68079 |
| 23.0 | .5247697 | 6374 | .7978134 | 9015 | .3462008 | 1983 | 121 5 84.2 | 52.7 | 0.23 | 67861 |
| 23.5 | .5319765 | 8445 | .7937304 | 8196 | .3444287 | 4269 | 121 34 64.3 | 32.8 | 0.16 | 67637 |
| 24.0 | .5391454 | 0138 | .7895913 | 6816 | .3426322 | 6311 | 122 3 44.5 | 12.9 | 0.10 | 67407 |
| 24.5 | .5462758 | 1445 | .7853964 | 4878 | .3408115 | 8110 | 122 31 84.8 | 53.1 | +0.03 | 67171 |
| 25.0 | .5533673 | 2364 | .7811459 | 2385 | .3389667 | 9669 | 123 0 65.3 | 33.5 | −0.03 | 66930 |
| 25.5 | .5604193 | 2888 | .7768401 | 9338 | .3370980 | 0989 | 123 29 46.0 | 14.1 | 0.10 | 66683 |
| 26.0 | .5674312 | 3011 | .7724795 | 5744 | .3352054 | 2070 | 123 57 86.7 | 54.7 | 0.17 | 66430 |
| 26.5 | .5744027 | 2730 | .7680642 | 1602 | .3332891 | 2914 | 124 26 67.7 | 35.5 | 0.23 | 66171 |
| 27.0 | .5813333 | 2040 | .7635946 | 6918 | .3313494 | 3524 | 124 55 48.7 | 16.5 | 0.29 | 65907 |
| 27.5 | .5882224 | 0935 | .7590711 | 1694 | .3293863 | 3900 | 125 23 89.8 | 57.6 | 0.34 | 65639 |
| 28.0 | .5950696 | :9412 | .7544941 | 5935 | .3273999 | 4043 | 125 52 71.1 | 38.8 | 0.39 | 65366 |
| 28.5 | .6018743 | 7463 | .7498641 | 9646 | .3253905 | 3956 | 126 21 52.5 | 20.2 | 0.44 | 65088 |
| 29.0 | .6086361 | 5086 | .7451813 | 2830 | .3233583 | 3641 | 126 50 34.1 | 1.7 | 0.48 | 64805 |
| 29.5 | .6153545 | 2275 | .7404461 | 5489 | .3213033 | 3098 | 127 18 75.8 | 43.3 | 0.51 | 64518 |
| 30.0 | .6220291 | :9026 | .7356588 | 7627 | .3192259 | 2331 | 127 47 57.6 | 25.0 | 0.54 | 64227 |
| 30.5 | .6286595 | 5335 | .7308197 | 9247 | .3171260 | 1339 | 128 16 39.6 | 6.9 | 0.56 | 63931 |
| 31.0 | .6352453 | 1198 | .7259292 | :0353 | .3150038 | 0124 | 128 44 81.8 | 49.0 | 0.57 | 63631 |
| 31.5 | .6417860 | 6610 | .7209876 | :0948 | .3128595 | 8688 | 129 13 64.1 | 31.2 | 0.57 | 63328 |
| Aug. 1.0 | .6482811 | 1567 | .7159954 | :1037 | .3106933 | 7033 | 129 42 46.6 | 13.6 | 0.56 | 63022 |
| 1.5 | .6547304 | 6065 | .7109528 | :0622 | .3085052 | 5159 | 130 10 89.3 | 56.3 | 0.55 | 62712 |
| 2.0 | −.6611332 | 0100 | +.7058601 | 9706 | +.3062955 | 3069 | 130 39 72.2 | 39.1 | −0.54 | 62399 |

NOTE.—The accented letters correspond to the mean equinox and equator of Jan. 0d.0.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ = ☉'s True Longitude. | λ′ | β = ☉'s Latitude. | Log. Rad. Vect. = ρ. |
| Aug. 2.5 | −.6674893 | 3667 | +.7007177 | 8293 | +.3040642 | 0763 | 131° 8′ 55″.3 | 22″.2 | −0″.51 | 0.00 62082 |
| 3.0 | .6737982 | 6762 | .6955260 | 6387 | .3018115 | 8243 | 131 37 38.7 | 5.5 | 0.48 | 61762 |
| 3.5 | .6800595 | :9381 | .6902854 | 3992 | .2995376 | 5511 | 132 5 82.3 | 49.0 | 0.44 | 61439 |
| 4.0 | .6862728 | 1521 | .6849962 | :1111 | .2972427 | 2569 | 132 34 66.1 | 32.7 | 0.40 | 61114 |
| 4.5 | .6924377 | 3176 | .6796588 | 7748 | .2949269 | 9418 | 133 3 50.1 | 16.6 | 0.35 | 60786 |
| 5.0 | .6985537 | 4343 | .6742735 | 3905 | .2925903 | 6060 | 133 32 34.4 | 0.8 | 0.29 | 60455 |
| 5.5 | .7046204 | 5017 | .6688405 | 9586 | .2902331 | 2495 | 134 0 78.9 | 45.2 | 0.23 | 60120 |
| 6.0 | .7106375 | 5195 | .6633602 | 4793 | .2878554 | 8725 | 134 29 63.8 | 30.0 | 0.17 | 59782 |
| 6.5 | .7166045 | 4872 | .6578330 | 9532 | .2854573 | 4751 | 134 58 49.0 | 15.1 | 0.11 | 59442 |
| 7.0 | .7225210 | 4045 | .6522592 | 3804 | .2830390 | 0575 | 135 27 34.4 | 0.5 | −0.05 | 59099 |
| 7.5 | .7283865 | 2708 | .6466391 | 7614 | .2806006 | 6198 | 135 55 80.1 | 46.2 | +0.01 | 58753 |
| 8.0 | .7342007 | 0857 | .6409731 | :0964 | .2781423 | 1622 | 136 24 66.3 | 32.3 | 0.08 | 58404 |
| 8.5 | .7399632 | 8489 | .6352616 | 3859 | .2756642 | 6848 | 136 53 52.8 | 18.7 | 0.15 | 58051 |
| 9.0 | .7456736 | 5601 | .6295050 | 6303 | .2731665 | 1879 | 137 22 39.6 | 5.4 | 0.21 | 57695 |
| 9.5 | .7513313 | 2186 | .6237036 | 8299 | .2706493 | 6714 | 137 50 86.7 | 52.4 | 0.27 | 57336 |
| 10.0 | .7569360 | 8241 | .6178576 | 9849 | .2681129 | 1357 | 138 19 74.2 | 39.8 | 0.33 | 56974 |
| 10.5 | .7624872 | 3761 | .6119675 | :0959 | .2655573 | 5808 | 138 48 62.1 | 27.6 | 0.37 | 56609 |
| 11.0 | .7679845 | 8743 | .6060339 | 1632 | .2629828 | :0070 | 139 17 50.3 | 15.8 | 0.42 | 56239 |
| 11.5 | .7734274 | 3180 | .6000569 | 1872 | .2603894 | 4143 | 139 46 38.9 | 4.4 | 0.46 | 55866 |
| 12.0 | .7788156 | 7071 | .5940368 | 1680 | .2577773 | 9029 | 140 14 87.9 | 53.3 | 0.50 | 55489 |
| 12.5 | .7841487 | 0410 | .5879742 | :1064 | .2551467 | 1730 | 140 43 77.3 | 42.6 | 0.53 | 55107 |
| 13.0 | .7894260 | 3192 | .5818694 | :0025 | .2524977 | 5248 | 141 12 67.0 | 32.3 | 0.55 | 54721 |
| 13.5 | .7946472 | 5413 | .5757228 | 8569 | .2498305 | 8583 | 141 41 57.2 | 22.4 | 0.56 | 54331 |
| 14.0 | .7998120 | 7070 | .5695348 | 6698 | .2471454 | 1789 | 142 10 47.8 | 12.9 | 0.57 | 53936 |
| 14.5 | .8049198 | 8157 | .5633058 | 4418 | .2444425 | 4717 | 142 39 38.7 | 3.7 | 0.56 | 53537 |
| 15.0 | .8099702 | 8671 | .5570363 | 1732 | .2417219 | 7518 | 143 7 90.0 | 54.9 | 0.55 | 53133 |
| 15.5 | .8149629 | 8607 | .5507268 | 8646 | .2389839 | :0145 | 143 36 81.7 | 46.6 | 0.53 | 52725 |
| 16.0 | .8198974 | 7962 | .5443777 | 5164 | .2362287 | 2600 | 144 5 73.8 | 38.6 | 0.51 | 52311 |
| 16.5 | .8247731 | 6729 | .5379894 | :1290 | .2334564 | 4884 | 144 34 66.3 | 31.0 | 0.47 | 51891 |
| 17.0 | .8295897 | 4905 | .5315623 | 7028 | .2306673 | 7000 | 145 3 59.1 | 23.8 | 0.43 | 51467 |
| 17.5 | .8343469 | 2487 | .5250970 | 2384 | .2278615 | 8949 | 145 32 52.3 | 17.0 | 0.39 | 51038 |
| 18.0 | .8390443 | :9472 | .5185939 | 7361 | .2250393 | 0735 | 146 1 45.9 | 10.5 | 0.34 | 50640 |
| 18.5 | .8436815 | 5854 | .5120533 | 1964 | .2222008 | 2357 | 146 30 39.9 | 4.4 | 0.28 | 50164 |
| 19.0 | .8482580 | 1630 | .5054759 | 6199 | .2193463 | 3818 | 146 58 94.2 | 58.7 | 0.22 | 49719 |
| 19.5 | .8527736 | 6795 | .4988621 | :0070 | .2164760 | 5122 | 147 27 88.9 | 53.3 | 0.16 | 49269 |
| 20.0 | .8572279 | 1351 | .4922124 | 3581 | .2135901 | 6270 | 147 56 84.1 | 48.3 | 0.10 | 48815 |
| 20.5 | .8616206 | 5288 | .4855274 | 6740 | .2106889 | 7265 | 148 25 79.5 | 43.6 | +0.04 | 48355 |
| 21.0 | .8659512 | 8605 | .4788076 | 9550 | .2077727 | 8110 | 148 54 75.3 | 39.4 | −0.03 | 47890 |
| 21.5 | .8702194 | 1298 | .4720535 | 2017 | .2048416 | 8806 | 149 23 71.4 | 35.4 | 0.09 | 47420 |
| 22.0 | .8744250 | 3366 | .4652657 | 4147 | .2018958 | 9355 | 149 52 67.8 | 31.8 | 0.16 | 46944 |
| 22.5 | .8785675 | 4802 | .4584445 | 5943 | .1989355 | 9759 | 150 21 64.6 | 28.5 | 0.22 | 46464 |
| 23.0 | .8826466 | 5605 | .4515906 | 7412 | .1959609 | :0020 | 150 50 61.7 | 25.6 | 0.28 | 45980 |
| 23.5 | .8866621 | 5771 | .4447043 | 8557 | .1929724 | :0142 | 151 19 59.1 | 22.9 | 0.34 | 45491 |
| 24.0 | .8906137 | 5299 | .4377862 | 9383 | .1899702 | :0127 | 151 48 56.9 | 20.6 | 0.39 | 44997 |
| 24.5 | .8945010 | 4184 | .4308369 | 9898 | .1869545 | 9977 | 152 17 55.0 | 18.6 | 0.44 | 44500 |
| 25.0 | .8983238 | 2424 | .4238569 | :0105 | .1839254 | 9692 | 152 46 53.5 | 17.0 | 0.49 | 43999 |
| 25.5 | .9020818 | 0016 | .4168468 | :0011 | .1808832 | 9277 | 153 15 52.2 | 15.7 | 0.52 | 43493 |
| 26.0 | .9057748 | 6958 | .4098070 | 9620 | .1778282 | 8734 | 153 44 51.2 | 14.7 | 0.55 | 42983 |
| 26.5 | .9094025 | 3247 | .4027381 | 8938 | .1747607 | 8066 | 154 13 50.6 | 14.0 | 0.57 | 42472 |
| 27.0 | .9129646 | 8881 | .3956405 | 7969 | .1716808 | 7273 | 154 42 50.3 | 13.7 | 0.58 | 41958 |
| 27.5 | .9164610 | 3857 | .3885148 | 6719 | .1685887 | 6359 | 155 11 50.3 | 13.7 | 0.58 | 41439 |
| 28.0 | .9198915 | 8175 | .3813615 | 5193 | .1654846 | 5325 | 155 40 50.8 | 14.1 | 0.58 | 40916 |
| 28.5 | .9232557 | 1829 | .3741811 | 3396 | .1623688 | 4174 | 156 9 51.6 | 14.8 | 0.57 | 40393 |
| 29.0 | .9265535 | 4820 | .3669742 | :1333 | .1592415 | 2907 | 156 38 52.7 | 15.8 | 0.55 | 39867 |
| 29.5 | .9297846 | 7144 | .3597412 | :9010 | .1561029 | 1528 | 157 7 54.1 | 17.1 | 0.53 | 39339 |
| 30.0 | .9329489 | 8800 | .3524827 | 6431 | .1529533 | :0038 | 157 36 55.9 | 18.9 | 0.50 | 38808 |
| 30.5 | .9360463 | :9787 | .3451993 | 3604 | .1497929 | 8441 | 158 5 58.1 | 21.0 | 0.46 | 38277 |
| 31.0 | .9390765 | 0102 | .3378914 | :0531 | .1466219 | 6737 | 158 34 60.6 | 23.5 | 0.42 | 37744 |
| 31.5 | .9420391 | :9741 | .3305594 | 7217 | .1434405 | 4930 | 159 3 63.5 | 26.3 | 0.37 | 37209 |
| Sept. 1.0 | .9449341 | 8705 | .3232039 | 3668 | .1402489 | 3020 | 159 32 66.8 | 29.6 | 0.32 | 36671 |
| 1.5 | −.9477612 | 6989 | +.3158253 | 9888 | +.1370474 | 1012 | 160 1 70.5 | 33.2 | −0.26 | 36132 |

NOTE.— : denotes a change in the preceding figure.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ = ☉'s True Longitude. | λ′ | β = ☉'s Latitude. | Log. Rad. Vect. = ρ. |
| Sept. 2.0 | −.9505202 | 4593 | +.3084242 | 5883 | +.1338361 | 8905 | 160° 30′ 74″.5 | 37″.2 | −0″.20 | 0.00<br>35593 |
| 2.5 | .9532109 | 1513 | .3010010 | 1657 | .1306152 | 6703 | 160 59 79.0 | 41.6 | 0.14 | 35052 |
| 3.0 | .9558332 | 7750 | .2935561 | 7213 | .1273850 | 4407 | 161 28 83.9 | 46.4 | 0.08 | 34509 |
| 3.5 | .9583868 | 3300 | .2860901 | 2558 | .1241456 | 2019 | 161 57 89.3 | 51.7 | −0.01 | 33965 |
| 4.0 | .9608715 | 8161 | .2786034 | 7696 | .1208972 | 9541 | 162 26 95.1 | 57.5 | +0.06 | 33421 |
| 4.5 | .9632871 | 2331 | .2710966 | 2633 | .1176401 | 6977 | 162 56 41.4 | 3.7 | 0.13 | 32875 |
| 5.0 | .9656335 | 5809 | .2635701 | 7373 | .1143744 | 4326 | 163 25 48.2 | 10.4 | 0.19 | 32327 |
| 5.5 | .9679104 | 8592 | .2560245 | 1922 | .1111004 | 1592 | 163 54 55.4 | 17.6 | 0.25 | 31779 |
| 6.0 | .9701176 | 0679 | .2484604 | 6286 | .1078184 | 8778 | 164 23 63.1 | 25.3 | 0.30 | 31230 |
| 6.5 | .9722549 | 2066 | .2408782 | ;0469 | .1045285 | 5885 | 164 52 71.3 | 33.4 | 0.35 | 30679 |
| 7.0 | .9743222 | 2753 | .2332784 | 4475 | .1012309 | 2915 | 165 21 80.0 | 42.1 | 0.40 | 30127 |
| 7.5 | .9763193 | 2738 | .2256615 | 8310 | .0979259 | 9871 | 165 50 89.3 | 51.3 | 0.44 | 29574 |
| 8.0 | .9782460 | 2020 | .2180281 | 1980 | .0946136 | 6754 | 166 20 39.0 | 0.9 | 0.48 | 29019 |
| 8.5 | .9801021 | 0596 | .2103787 | 5490 | .0912944 | 3568 | 166 49 49.2 | 11.0 | 0.51 | 28463 |
| 9.0 | .9818872 | 8462 | .2027137 | 8844 | .0879684 | ;0314 | 167 18 59.9 | 21.7 | 0.53 | 27905 |
| 9.5 | .9836013 | 5618 | .1950338 | 2049 | .0846358 | 6994 | 167 47 71.2 | 32.9 | 0.55 | 27345 |
| 10.0 | .9852441 | 2062 | .1873394 | 5108 | .0812969 | 3611 | 168 16 83.0 | 44.7 | 0.56 | 26784 |
| 10.5 | .9868154 | 7790 | .1796308 | 8026 | .0779519 | ;0167 | 168 45 95.4 | 57.0 | 0.56 | 26221 |
| 11.0 | .9883152 | 2803 | .1719088 | ;0809 | .0746010 | 6664 | 169 15 48.3 | 9.9 | 0.55 | 25656 |
| 11.5 | .9897433 | 7099 | .1641739 | 3463 | .0712443 | 3103 | 169 44 61.8 | 23.3 | 0.53 | 25089 |
| 12.0 | .9910994 | 0675 | .1564266 | 5993 | .0678823 | 9488 | 170 13 75.8 | 37.3 | 0.50 | 24519 |
| 12.5 | .9923832 | 3528 | .1486677 | 8407 | .0645152 | 5823 | 170 42 90.3 | 51.7 | 0.47 | 23947 |
| 13.0 | .9935946 | 5658 | .1408977 | ;0710 | .0611433 | 2109 | 171 12 44.4 | 6.7 | 0.44 | 23372 |
| 13.5 | .9947335 | 7062 | .1331171 | 2907 | .0577669 | 8351 | 171 41 61.0 | 22.2 | 0.40 | 22794 |
| 14.0 | .9957998 | 7741 | .1253266 | 5005 | .0543861 | 4548 | 172 10 77.1 | 38.3 | 0.35 | 22214 |
| 14.5 | .9967933 | 7691 | .1175266 | 7008 | .0510012 | 0705 | 172 39 93.8 | 54.9 | 0.30 | 21630 |
| 15.0 | .9977139 | 6913 | .1097177 | 8922 | .0476123 | 6821 | 173 9 51.0 | 12.1 | 0.24 | 21044 |
| 15.5 | .9985613 | 5402 | .1019007 | ;0755 | .0442198 | 2901 | 173 38 68.7 | 29.7 | 0.18 | 20454 |
| 16.0 | .9993355 | 3161 | .0940761 | 2511 | .0408240 | 8948 | 174 7 86.9 | 47.9 | 0.11 | 19861 |
| 16.5 | 1.0000365 | 0187 | .0862445 | 4197 | .0374252 | 4966 | 174 37 45.6 | 6.6 | +0.05 | 19266 |
| 17.0 | 1.0006641 | 6479 | .0784065 | 5819 | .0340236 | 0955 | 175 6 64.9 | 25.8 | −0.02 | 18668 |
| 17.5 | 1.0012182 | 2036 | .0705626 | 7382 | .0306193 | 6917 | 175 35 84.6 | 45.4 | 0.08 | 18066 |
| 18.0 | 1.0016987 | 6857 | .0627134 | 8891 | .0272128 | 2857 | 176 5 44.8 | 5.5 | 0.15 | 17461 |
| 18.5 | 1 0021056 | 0942 | .0548597 | ;0356 | .0238044 | 8778 | 176 34 65.5 | 26.1 | 0.21 | 16854 |
| 19.0 | 1.0024389 | 4291 | .0470018 | 1778 | .0203944 | 4683 | 177 3 86.8 | 47.3 | 0.27 | 16244 |
| 19.5 | 1.0026984 | 6902 | .0391405 | 3167 | .0169829 | ;0573 | 177 33 48.5 | 9.0 | 0.33 | 15631 |
| 20.0 | 1.0028841 | 8776 | .0312766 | 4529 | .0135702 | 6450 | 178 2 70.6 | 31.1 | 0.39 | 15015 |
| 20.5 | 1.0029961 | 9912 | .0234106 | 5870 | .0001566 | 2319 | 178 31 93.2 | 53.7 | 0.44 | 14396 |
| 21.0 | 1.0030342 | 0309 | .0155430 | 7195 | .0067424 | 8182 | 179 1 56.3 | 16.7 | 0.49 | 13775 |
| 21.5 | 1.0029984 | 9967 | +.0076745 | 8511 | +.0033278 | 4041 | 179 30 79.8 | 40.1 | 0.53 | 13152 |
| 22.0 | 1.0028887 | 8887 | −.0001944 | 0177 | −.0000871 | 0104 | 180 0 43.7 | 4.0 | 0.56 | 12527 |
| 22.5 | 1.0027053 | 7069 | .0080629 | ;8861 | .0035018 | 4246 | 180 29 68.2 | 28.4 | 0.59 | 11899 |
| 23.0 | 1.0024481 | 4514 | .0159306 | 7538 | .0069160 | 8384 | 180 58 93.1 | 53.2 | 0.60 | 11269 |
| 23.5 | 1.0021170 | 1220 | .0237967 | 6199 | .0103294 | 2514 | 181 28 58.4 | 18.5 | 0.61 | 10638 |
| 24.0 | 1.0017122 | 7189 | .0316607 | 4839 | .0137419 | 6635 | 181 57 84.1 | 44.2 | 0.61 | 10006 |
| 24.5 | 1.0012338 | 2421 | .0395220 | 3452 | .0171532 | 0743 | 182 27 50.3 | 10.3 | 0.60 | 09372 |
| 25.0 | 1.0006818 | 6918 | .0473800 | 2032 | .0205631 | 4838 | 182 56 76.9 | 36.8 | 0.59 | 08737 |
| 25.5 | 1.0000562 | 0679 | .0552342 | 0574 | .0239712 | 8915 | 183 26 43.9 | 3.8 | 0.57 | 08101 |
| 26.0 | .9993572 | 3706 | .0630839 | ;9071 | .0273774 | 2973 | 183 55 71.3 | 31.2 | 0.54 | 07465 |
| 26.5 | .9985848 | 5999 | .0709286 | 7518 | .0307813 | 7008 | 184 24 99.1 | 59.0 | 0.51 | 06828 |
| 27.0 | .9977389 | 7556 | .0787678 | 5911 | .0341828 | 1019 | 184 54 67.5 | 27.3 | 0.47 | 06191 |
| 27.5 | .9968197 | 8381 | .0866009 | 4242 | .0375817 | 5004 | 185 23 96.3 | 56.0 | 0.42 | 05555 |
| 28.0 | .9958273 | 8474 | .0944273 | 2508 | .0409777 | 8960 | 185 53 65.5 | 25.1 | 0.36 | 04919 |
| 28.5 | .9947617 | 7835 | .1022465 | 0701 | .0443704 | 2883 | 186 22 95.1 | 54.6 | 0.31 | 04282 |
| 29.0 | .9936230 | 6465 | .1100579 | ;8816 | .0477597 | 6772 | 186 52 65.2 | 24.7 | 0.25 | 03646 |
| 29.5 | .9924114 | 4366 | .1178609 | 6847 | .0511454 | 0625 | 187 21 95.8 | 55.2 | 0.19 | 03011 |
| 30.0 | .9911270 | 1539 | .1256550 | 4790 | .0545273 | 4441 | 187 51 66.8 | 26.2 | 0.12 | 02377 |
| 30.5 | .9897697 | 7983 | .1334398 | 2639 | .0579051 | 8215 | 188 20 98.3 | 57.6 | −0.06 | 01743 |
| Oct. 1.0 | .9883396 | 3699 | .1412148 | 0391 | .0612786 | 1946 | 188 50 70.4 | 29.7 | +0.01 | 01111 |
| 1.5 | .9868369 | 8689 | .1489793 | 8038 | .0646475 | 5631 | 189 20 42.9 | 2.1 | 0.07 | 00480 |
| 2.0 | −.9852616 | 2953 | −.1567326 | 5573 | −.0680117 | ;9270 | 189 49 75.9 | 35.1 | +0.14 | ◆99851 |

◆ The first figures of this and the following logarithms are 9.99.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ=☉'s True Longitude. | | | λ′ | β=☉'s Latitude. | Log. Rad. Vect. = ρ. |
| Oct. 2.5 | —.9836138 | 6492 | —.1644743 | 2992 | —.0713709 | 2858 | 190° | 19′ | 49″.4 | 8″.5 | +0″.20 | 9.99<br>99222 |
| 3.0 | .9818936 | 9307 | .1722039 | 0290 | .0747248 | 6394 | 190 | 48 | 83.4 | 42.5 | 0.26 | 98594 |
| 3.5 | .9801011 | 1399 | .1799208 | 7461 | .0780732 | :9875 | 191 | 18 | 58.0 | 17.0 | 0.31 | 97968 |
| 4.0 | .9782364 | 2770 | .1876245 | 4501 | .0814159 | 3299 | 191 | 47 | 93.1 | 52.1 | 0.36 | 97344 |
| 4.5 | .9762995 | 3418 | .1953145 | 1404 | .0847527 | 6664 | 192 | 17 | 68.7 | 27.6 | 0.40 | 96721 |
| 5.0 | .9742905 | 3345 | .2029903 | 8165 | .0880832 | :9966 | 192 | 47 | 44.8 | 3.6 | 0.44 | 96100 |
| 5.5 | .9722095 | 2552 | .2106514 | 4779 | .0914074 | 3205 | 193 | 16 | 81.5 | 40.3 | 0.47 | 95480 |
| 6.0 | .9900567 | 1042 | .2182972 | 1240 | .0947249 | 6377 | 193 | 46 | 58.7 | 17.5 | 0.49 | 94861 |
| 6.5 | .9678321 | 8813 | .2259271 | 7542 | .0980356 | 9481 | 194 | 15 | 96.5 | 55.2 | 0.51 | 94243 |
| 7.0 | .9655358 | 5867 | .2335404 | 3678 | .1013392 | 2514 | 194 | 46 | 74.9 | 33.6 | 0.52 | 93627 |
| 7.5 | .9631678 | 2204 | .2411367 | :9644 | .1046355 | 5474 | 195 | 15 | 53.9 | 12.6 | 0.51 | 93012 |
| 8.0 | .9607283 | 7827 | .2487154 | 5435 | .1079243 | 8360 | 195 | 44 | 93.5 | 52.1 | 0.51 | 92398 |
| 8.5 | .9582174 | 2735 | .2562759 | 1043 | .1112052 | 1166 | 196 | 14 | 73.6 | 32.2 | 0.50 | 91785 |
| 9.0 | .9556353 | 6931 | .2638177 | 6465 | .1144780 | 3892 | 196 | 44 | 54.3 | 12.8 | 0.48 | 91173 |
| 9.5 | .9529820 | :0415 | .2713402 | 1694 | .1177425 | 6534 | 197 | 13 | 95.6 | 54.0 | 0.45 | 90562 |
| 10.0 | .9502576 | 3189 | .2788427 | 6723 | .1209984 | 9091 | 197 | 43 | 77.4 | 35.8 | 0.41 | 89951 |
| 10.5 | .9474623 | 5253 | .2863247 | 1547 | .1242454 | 1559 | 198 | 13 | 59.8 | 18.2 | 0.37 | 89341 |
| 11.0 | .9445962 | 6610 | .2937857 | 6161 | .1274832 | 3935 | 198 | 43 | 42.9 | 1.2 | 0.33 | 88732 |
| 11.5 | .9416594 | 7259 | .3012252 | 0560 | .1307116 | 6217 | 199 | 12 | 86.5 | 44.7 | 0.28 | 88122 |
| 12.0 | .9386522 | 7205 | .3086425 | 4738 | .1339305 | 8404 | 199 | 42 | 70.6 | 28.7 | 0.22 | 87512 |
| 12.5 | .9355746 | 6446 | .3160371 | :8689 | .1371396 | 0493 | 200 | 12 | 55.4 | 13.5 | 0.16 | 86903 |
| 13.0 | .9324268 | 4985 | .3234083 | 2406 | .1403386 | 2481 | 200 | 41 | 100.8 | 58.8 | 0.10 | 86294 |
| 13.5 | .9292090 | 2824 | .3307556 | 5884 | .1435272 | 4365 | 201 | 11 | 86.7 | 44.6 | +0.04 | 85684 |
| 14.0 | .9259215 | 9967 | .3380784 | :9117 | .1467052 | 6144 | 201 | 41 | 73.1 | 31.0 | —0.03 | 85074 |
| 14.5 | .9225643 | 6412 | .3453761 | 2099 | .1498723 | 7813 | 202 | 11 | 60.1 | 18.0 | 0.10 | 84464 |
| 15.0 | .9191377 | 2164 | .3526480 | 4823 | .1530282 | :9371 | 202 | 41 | 47.7 | 5.5 | 0.16 | 83854 |
| 15.5 | .9156419 | 7223 | .3598936 | 7284 | .1561726 | 0813 | 203 | 10 | 95.8 | 53.6 | 0.23 | 83244 |
| 16.0 | .9120772 | 1594 | .3671122 | :9476 | .1593053 | 2139 | 203 | 40 | 84.5 | 42.2 | 0.29 | 82633 |
| 16.5 | .9084438 | 5277 | .3743032 | 1392 | .1624261 | 3346 | 204 | 10 | 73.7 | 31.3 | 0.35 | 82022 |
| 17.0 | .9047419 | 8275 | .3814660 | 3026 | .1655346 | 4430 | 204 | 40 | 63.5 | 21.0 | 0.41 | 81411 |
| 17.5 | .9009718 | :0591 | .3886002 | 4374 | .1686306 | 5389 | 205 | 10 | 53.7 | 11.2 | 0.46 | 80799 |
| 18.0 | .8971338 | 2229 | .3957052 | 5430 | .1717139 | 6221 | 205 | 40 | 44.4 | 1.9 | 0.51 | 80187 |
| 18.5 | .8932282 | 3190 | .4027803 | 6187 | .1747843 | 6924 | 206 | 9 | 95.6 | 53.0 | 0.55 | 79575 |
| 19.0 | .8892553 | 3479 | .4098248 | 6638 | .1778413 | 7493 | 206 | 39 | 87.3 | 44.6 | 0.58 | 78963 |
| 19.5 | .8852153 | 3096 | .4168383 | 6779 | .1808848 | 7927 | 207 | 9 | 79.5 | 36.7 | 0.60 | 78351 |
| 20.0 | .8811086 | 2046 | .4238202 | 6605 | .1839146 | 8225 | 207 | 39 | 72.1 | 29.3 | 0.62 | 77739 |
| 20.5 | .8769356 | :0333 | .4307699 | 6109 | .1869304 | 8382 | 208 | 9 | 65.2 | 22.4 | 0.63 | 77127 |
| 21.0 | .8726965 | 7960 | .4376869 | 5286 | .1899319 | 8397 | 208 | 39 | 58.7 | 15.8 | 0.64 | 76516 |
| 21.5 | .8683916 | 4928 | .4445706 | 4130 | .1929189 | 8266 | 209 | 9 | 52.6 | 9.6 | 0.63 | 75906 |
| 22.0 | .8640213 | 1242 | .4514205 | 2636 | .1958913 | 7990 | 209 | 39 | 47.0 | 3.9 | 0.62 | 75296 |
| 22.5 | .8595860 | 6906 | .4582361 | 0799 | .1988486 | 7562 | 210 | 8 | 101.9 | 58.8 | 0.60 | 74686 |
| 23.0 | .8550861 | 1924 | .4650170 | :8616 | .2017911 | 6987 | 210 | 38 | 97.3 | 54.1 | 0.58 | 74078 |
| 23.5 | .8505218 | 6298 | .4717626 | 6079 | .2047180 | 6256 | 211 | 8 | 93.0 | 49.8 | 0.54 | 73471 |
| 24.0 | .8458935 | :0032 | .4784723 | 3184 | .2076294 | 5370 | 211 | 38 | 89.1 | 45.8 | 0.50 | 72865 |
| 24.5 | .8412016 | 3130 | .4851455 | :9924 | .2105250 | 4326 | 212 | 8 | 85.6 | 42.3 | 0 46 | 72261 |
| 25.0 | .8364465 | 5596 | .4917818 | 6295 | .2134045 | 3121 | 212 | 38 | 82.6 | 39.2 | 0.41 | 71660 |
| 25.5 | .8316285 | 7433 | .4983807 | 2292 | .2162677 | 1753 | 213 | 8 | 80.0 | 36.5 | 0.35 | 71061 |
| 26.0 | .8267480 | 8645 | .5049417 | 7910 | .2191144 | 0221 | 213 | 38 | 77.8 | 34.2 | 0.29 | 70464 |
| 26.5 | .8218053 | 9235 | .5114643 | 3144 | .2219445 | 8522 | 214 | 8 | 76.0 | 32.3 | 0.23 | 69869 |
| 27.0 | .8168009 | 9208 | .5179481 | 7990 | .2247577 | 6655 | 214 | 38 | 74.6 | 30.9 | 0.17 | 69276 |
| 27.5 | .8117353 | 8569 | .5243926 | 2443 | .2275538 | 4616 | 215 | 8 | 73.7 | 29.9 | 0.11 | 68687 |
| 28.0 | .8066087 | 7319 | .5307973 | 6499 | .2303327 | 2406 | 215 | 38 | 73.2 | 29.3 | —0.05 | 68101 |
| 28.5 | .8014215 | 5464 | .5371619 | 0154 | .2330940 | 0019 | 216 | 8 | 73.0 | 29.1 | +0.01 | 67518 |
| 29.0 | .7961741 | 3007 | .5434858 | 3402 | .2358377 | 7475 | 216 | 38 | 73.3 | 29.4 | 0.08 | 66938 |
| 29.5 | .7908668 | 9951 | .5497686 | 6239 | .2385635 | 4716 | 217 | 8 | 74.1 | 30.1 | 0.14 | 66363 |
| 30.0 | .7855000 | 6299 | .5560099 | :8661 | .2412713 | 1795 | 217 | 38 | 75.3 | 31.2 | 0.21 | 65791 |
| 30.5 | .7800742 | 2058 | .5622091 | 0662 | .2439610 | 8693 | 218 | 8 | 76.9 | 32.7 | 0.27 | 65222 |
| 31.0 | .7745897 | 7229 | .5683657 | 2237 | .2466323 | 5407 | 218 | 38 | 78.9 | 34.6 | 0.33 | 64658 |
| 31.5 | .7690468 | 1817 | .5744793 | 3382 | .2492850 | 1935 | 219 | 8 | 81.3 | 36.9 | 0.38 | 64098 |
| Nov. 1.0 | .7634458 | 5823 | .5805495 | 4094 | .2519189 | 8276 | 219 | 38 | 84.2 | 39.7 | 0.42 | 63541 |
| 1.5 | —.7577873 | 9255 | —.5865759 | 4368 | —.2545339 | 4427 | 220 | 8 | 87.6 | 43.1 | +0.45 | 62988 |

NOTE.—: denotes a change in the preceding figure.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ=☉'s True Longitude. | λ′ | β=☉'s Latitude. | Log. Rad. Vect.=ρ. |
| Nov. 2.0 | —.7520716 | 2114 | —.5925581 | 4200 | —.2571297 | 0387 | 220° 38′ 91″.5 | 47″.0 | +0″.48 | 9.99<br>62440 |
| 2.5 | .7462990 | 4405 | .5984956 | 3585 | .2597060 | 6151 | 221 8 95.9 | 51.3 | 0.50 | 61896 |
| 3.0 | .7404699 | 6130 | .6043874 | 2518 | .2622627 | 1720 | 221 38 100.7 | 56.0 | 0.51 | 61356 |
| 3.5 | .7345846 | 7294 | .6102345 | 0994 | .2647997 | 7092 | 222 9 45.9 | 1.1 | 0.51 | 60820 |
| 4.0 | .7286436 | 7900 | .6160351 | ;9010 | .2673167 | 2264 | 222 39 51.7 | 6.8 | 0.51 | 60289 |
| 4.5 | .7226472 | 7952 | .6217892 | 6561 | .2698136 | 7235 | 223 9 58.0 | 13.0 | 0.50 | 59761 |
| 5.0 | .7165959 | 7455 | .6274965 | 3645 | .2722902 | 1903 | 223 39 64.7 | 19.6 | 0.48 | 59237 |
| 5.5 | .7104900 | 6412 | .6331564 | 0255 | .2747463 | 6566 | 224 9 71.9 | 26.7 | 0.46 | 58718 |
| 6.0 | .7043300 | 4828 | .6387685 | 6387 | .2771817 | 0922 | 224 39 79.7 | 34.4 | 0.43 | 58203 |
| 6.5 | .6981163 | 2707 | .6443323 | 2036 | .2795962 | 5069 | 225 9 88.0 | 42.7 | 0.39 | 57691 |
| 7.0 | .6918492 | ;0052 | .6498474 | 7198 | .2819896 | 9006 | 225 39 96.8 | 51.4 | 0.35 | 57183 |
| 7.5 | .6855293 | 6869 | .6553132 | 1867 | .2843617 | 2729 | 226 10 46.1 | 0.6 | 0.30 | 56679 |
| 8.0 | .6791569 | 3161 | .6607293 | 6040 | .2867122 | 6237 | 226 40 55.8 | 10.3 | 0.24 | 56178 |
| 8.5 | .6727324 | 8931 | .6660954 | ;9712 | .2890409 | ;9527 | 227 10 66.1 | 20.5 | 0.18 | 55680 |
| 9.0 | .6662563 | 4186 | .6714109 | 2879 | .2913476 | 2597 | 227 40 76.9 | 31.2 | 0.12 | 55185 |
| 9.5 | .6597291 | 8930 | .6766753 | 5535 | .2936323 | 5447 | 228 10 88.2 | 42.4 | +0.06 | 54694 |
| 10.0 | .6531511 | 3165 | .6818882 | 7676 | .2958947 | 8074 | 228 40 100.0 | 54.1 | .00 | 54206 |
| 10.5 | .6465229 | 6899 | .6870493 | ;9299 | .2981346 | 0476 | 229 11 52.2 | 6.2 | —0.06 | 53720 |
| 11.0 | .6398450 | ;0135 | .6921580 | 0398 | .3003518 | 2651 | 229 41 64.9 | 18.8 | 0.13 | 53237 |
| 11.5 | .6331178 | 2878 | .6972138 | 0961 | .3025460 | 4596 | 230 11 78.1 | 32.0 | 0.19 | 52757 |
| 12.0 | .6263418 | 5133 | .7022163 | 1006 | .3047170 | 6309 | 230 41 91.8 | 45.6 | 0.26 | 52280 |
| 12.5 | .6195174 | 6904 | .7071650 | 0505 | .3068647 | 7789 | 231 11 105.9 | 59.7 | 0.32 | 51804 |
| 13.0 | .6126452 | 8197 | .7120595 | ;9463 | .3089889 | 9035 | 231 42 60.4 | 14.1 | 0.38 | 51331 |
| 13.5 | .6057257 | 9017 | .7168996 | 7877 | .3110894 | 0043 | 232 12 75.4 | 29.0 | 0.43 | 50861 |
| 14.0 | .5987595 | 9370 | .7216845 | 5739 | .3131660 | 0813 | 232 42 90.9 | 44.4 | 0.48 | 50394 |
| 14.5 | .5917471 | 9261 | .7264139 | 3046 | .3152185 | 1341 | 233 13 46.8 | 0.2 | 0.52 | 49928 |
| 15.0 | .5846891 | 8695 | .7310876 | ;9797 | .3172467 | 1627 | 233 43 63.0 | 16.3 | 0.55 | 49464 |
| 15.5 | .5775859 | 7678 | .7357051 | 5985 | .3192505 | 1669 | 234 13 79.7 | 32.9 | 0.58 | 49002 |
| 16.0 | .5704382 | 6215 | .7402659 | 1607 | .3212296 | 1464 | 234 43 96.8 | 49.9 | 0.61 | 48543 |
| 16.5 | .5632465 | 4313 | .7447697 | 6658 | .3231840 | 1012 | 235 14 54.3 | 7.3 | 0.62 | 48086 |
| 17.0 | .5560114 | 1976 | .7492160 | 1135 | .3251134 | 0310 | 235 44 72.1 | 25.1 | 0.63 | 47631 |
| 17.5 | .5487334 | 9211 | .7536046 | 5035 | .3270177 | ;9357 | 236 14 90.3 | 43.3 | 0.63 | 47179 |
| 18.0 | .5414133 | 6024 | .7579349 | 8352 | .3288967 | 8152 | 236 45 48.9 | 1.8 | 0.63 | 46730 |
| 18.5 | .5340516 | 2421 | .7622068 | 1085 | .3307503 | 6692 | 237 15 67.8 | 20.6 | 0.61 | 46284 |
| 19.0 | .5266488 | 8407 | .7664198 | 3229 | .3325783 | 4976 | 237 45 87.0 | 39.7 | 0.59 | 45840 |
| 19.5 | .5192057 | 3990 | .7705736 | 4781 | .3343806 | 3004 | 238 15 106.6 | 59.2 | 0.56 | 45399 |
| 20.0 | .5117228 | 9175 | .7746679 | 5739 | .3361571 | 0774 | 238 46 66.5 | 19.0 | 0.53 | 44961 |
| 20.5 | .5042007 | 3968 | .7787024 | 6098 | .3379075 | 8283 | 239 16 86.6 | 39.0 | 0.49 | 44527 |
| 21.0 | .4966399 | 8373 | .7826767 | 5856 | .3396319 | 5532 | 239 46 107.0 | 59.3 | 0.44 | 44096 |
| 21.5 | .4890413 | 2401 | .7865902 | 5006 | .3413299 | 2518 | 240 17 67.7 | 20.0 | 0.39 | 43668 |
| 22.0 | .4814054 | 6055 | .7904429 | 3548 | .3430015 | ;9239 | 240 47 88.7 | 40.9 | 0.33 | 43243 |
| 22.5 | .4737327 | 9342 | .7942346 | 1480 | .3446466 | 5695 | 241 18 50.0 | 2.1 | 0.27 | 42824 |
| 23.0 | .4660238 | 2265 | .7979650 | 8799 | .3462649 | 1883 | 241 48 71.6 | 23.6 | 0.21 | 42408 |
| 23.5 | .4582793 | 4833 | .8016339 | 5503 | .3478566 | 7805 | 242 18 93.4 | 45.3 | 0.15 | 41995 |
| 24.0 | .4505000 | 7053 | .8052409 | 1588 | .3494213 | 3457 | 242 49 55.4 | 7.2 | 0.08 | 41587 |
| 24.5 | .4426864 | 8930 | .8087858 | 7052 | .3509591 | 8840 | 243 19 77.7 | 29.4 | —0.01 | 41185 |
| 25.0 | .4348390 | ;0469 | .8122684 | 1894 | .3524698 | 3953 | 243 49 100.3 | 51.9 | +0.06 | 40787 |
| 25.5 | .4269586 | ;1678 | .8156883 | 6109 | .3539534 | 8794 | 244 20 63.2 | 14.7 | 0.12 | 40394 |
| 26.0 | .4190457 | 2561 | .8190453 | 9695 | .3554097 | 3363 | 244 50 86.3 | 37.7 | 0.18 | 40006 |
| 26.5 | .4111009 | 3126 | .8223392 | 2650 | .3568386 | 7658 | 245 21 49.6 | 1.0 | 0.24 | 39624 |
| 27.0 | .4031247 | 3376 | .8255696 | 4970 | .3582400 | 1678 | 245 51 73.1 | 24.4 | 0.29 | 39248 |
| 27.5 | .3951179 | 3320 | .8287365 | 6655 | .3596139 | 5423 | 246 21 96.9 | 48.1 | 0.34 | 38877 |
| 28.0 | .3870810 | 2963 | .8318396 | 7702 | .3609602 | 8892 | 246 52 61.0 | 12.1 | 0.39 | 38510 |
| 28.5 | .3790145 | 2310 | .8348785 | 8107 | .3622788 | 2084 | 247 22 85.4 | 36.4 | 0.43 | 38152 |
| 29.0 | .3709191 | ;1368 | .8378532 | 7871 | .3635695 | 4997 | 247 53 50.0 | 0.9 | 0.46 | 37799 |
| 29.5 | .3627953 | 0142 | .8407634 | 6990 | .3648322 | 7630 | 248 23 74.8 | 25.6 | 0.48 | 37451 |
| 30.0 | .3546437 | 8637 | .8436090 | 5463 | .3660668 | ;9982 | 248 53 99.9 | 50.6 | 0.50 | 37109 |
| 30.5 | .3464649 | 6860 | .8463898 | 3288 | .3672734 | 2054 | 249 24 65.3 | 15.9 | 0.51 | 36775 |
| Dec. 1.0 | .3382594 | 4816 | .8491056 | 0463 | .3684518 | 3845 | 249 54 90.9 | 41.4 | 0.51 | 36447 |
| 1.5 | .3300278 | 2511 | .8517562 | 6986 | .3696019 | 5352 | 250 25 56.9 | 7.3 | 0.49 | 36125 |
| 2.0 | —.3217707 | 9951 | —.8543413 | 2854 | —.3707236 | 6576 | 250 55 83.2 | 33.5 | +0.48 | 35809 |

NOTE.—The accented letters correspond to the mean equinox and equator of Jan. 0d.0.

| Date. | RECTANGULAR EQUATORIAL. | | | | | | POLAR ECLIPTIC. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1876. | X. | X′. | Y. | Y′. | Z. | Z′. | λ=☉'s True Longitude. | λ′ | β=☉'s Latitude. | Log. Rad. Vect. = ρ. |
| Dec. 2.5 | —.3134887 | 7142 | —.8568607 | 8065 | —.3718168 | 7514 | 251° 26′ 49″.8 | 0″.0 | +0″.46 | 9.99<br>35500 |
| 3.0 | .3051825 | 4091 | .8593142 | 2618 | .3728816 | 8169 | 251 56 76.6 | 26.7 | 0.43 | 35197 |
| 3.5 | .2968526 | :0803 | .8617016 | 6509 | .3739177 | 8536 | 252 26 103.7 | 53.7 | 0.40 | 34900 |
| 4.0 | .2884995 | 7282 | .8640226 | :9737 | .3749251 | 8617 | 252 57 71.2 | 21.1 | 0.36 | 34610 |
| 4.5 | .2801239 | 3536 | .8662771 | 2300 | .3759036 | 8409 | 253 27 99.0 | 48.8 | 0.31 | 34326 |
| 5.0 | .2717264 | 9571 | .8684647 | 4194 | .3768532 | 7912 | 253 58 67.0 | 16.7 | 0.25 | 34048 |
| 5.5 | .2633077 | 5394 | .8705853 | 5418 | .3777738 | 7125 | 254 28 95.3 | 44.9 | 0.19 | 33775 |
| 6.0 | .2548683 | :1010 | .8726387 | 5970 | .3786652 | 6046 | 254 59 63.9 | 13.4 | 0.13 | 33508 |
| 6.5 | .2464089 | 6426 | .8746246 | 5848 | .3795273 | 4674 | 255 29 92.9 | 42.4 | +0.07 | 33246 |
| 7.0 | .2379301 | :1547 | .8765431 | 5050 | .3803601 | 3010 | 256 0 62.1 | 11.5 | .00 | 32990 |
| 7.5 | .2294325 | 6680 | .8783938 | 3575 | .3811635 | 1051 | 256 30 91.6 | 40.9 | —0.07 | 32740 |
| 8.0 | .2209168 | :1532 | .8801766 | 1422 | .3819374 | 8798 | 257 1 61.4 | 10.6 | 0.13 | 32496 |
| 8.5 | .2123835 | 6208 | .8818913 | 8587 | .3826818 | 6249 | 257 31 91.5 | 40.6 | 0.20 | 32257 |
| 9.0 | .2038334 | :0716 | .8835377 | 5070 | .3833965 | 3404 | 258 2 61.9 | 10.9 | 0.26 | 32022 |
| 9.5 | .1952671 | 5062 | .8851156 | 0868 | .3840815 | 0261 | 258 32 92.6 | 41.5 | 0.34 | 31792 |
| 10.0 | .1866851 | 9251 | .8866249 | 5980 | .3847367 | 6821 | 259 3 63.6 | 12.4 | 0.38 | 31569 |
| 10.5 | .1780882 | 3291 | .8880653 | 0403 | .3853620 | 3082 | 259 33 94.8 | 43.5 | 0.43 | 31348 |
| 11.0 | .1694772 | 7189 | .8894367 | 4136 | .3859573 | 9043 | 260 4 66.2 | 14.8 | 0.48 | 31132 |
| 11.5 | .1608527 | :0952 | .8907389 | 7177 | .3865225 | 4703 | 260 34 97.9 | 46.4 | 0.53 | 30921 |
| 12.0 | .1522152 | 4585 | .8919717 | 9524 | .3870576 | 0062 | 261 5 69.9 | 18.3 | 0.57 | 30714 |
| 12.5 | .1435656 | 8097 | .8931350 | 1176 | .3875625 | 5119 | 261 35 102.1 | 50.4 | 0.60 | 30510 |
| 13.0 | 1349046 | :1494 | .8942286 | 2132 | .3880372 | :9874 | 262 6 74.5 | 22.7 | 0.62 | 30311 |
| 13.5 | .1262329 | 4785 | .8952525 | 2390 | .3884816 | 4326 | 262 36 107.1 | 55·2 | 0.64 | 30116 |
| 14.0 | .1175512 | 7975 | .8962067 | 1952 | .3888957 | 8475 | 263 7 79.9 | 27.9 | 0.65 | 29925 |
| 14.5 | .1088602 | :1072 | .8970910 | 0815 | .3892794 | 2320 | 263 38 52.9 | 0.8 | 0.65 | 29738 |
| 15.0 | .1001607 | 4084 | .8979053 | 8978 | .3896327 | 5862 | 264 8 86.1 | 33.9 | 0.65 | 29555 |
| 15.5 | .0914533 | 7017 | .8986495 | 6440 | .3899555 | 9098 | 264 39 59.5 | 7.2 | 0.64 | 29376 |
| 16.0 | .0827387 | 9877 | .8993235 | 3200 | .3902478 | 2030 | 265 9 93.0 | 40.6 | 0.62 | 29200 |
| 16.5 | .0740176 | 2673 | .8999272 | 9257 | .3905096 | 4656 | 265 40 66.6 | 14.1 | 0.59 | 29029 |
| 17.0 | .0652909 | 5412 | .9004605 | 4610 | .3907409 | 6978 | 266 10 100.3 | 47.7 | 0.55 | 28862 |
| 17.5 | .0565593 | 8102 | .9009236 | 9261 | .3909417 | 8994 | 266 41 74.2 | 21.5 | 0.51 | 28699 |
| 18.0 | .0478234 | :0749 | .9013164 | 3209 | .3911119 | 0705 | 267 11 108.2 | 55.4 | 0.47 | 28540 |
| 18.5 | .0390839 | 3360 | .9016389 | 6454 | .3912515 | 2110 | 267 42 82.2 | 29.3 | 0.42 | 28385 |
| 19.0 | .0303416 | 5942 | .9018910 | 8996 | .3913605 | 3209 | 268 13 56.3 | 3.3 | 0.36 | 28235 |
| 19.5 | .0215972 | 8503 | .9020727 | 0827 | .3914390 | 4003 | 268 43 90.5 | 37.4 | 0.30 | 28089 |
| 20.0 | .0128514 | :1050 | .9021840 | 1967 | .3914869 | 4491 | 269 14 64.7 | 11.5 | 0.24 | 27947 |
| 20.5 | —.0041050 | 3591 | .9022249 | 2396 | .3915043 | 4674 | 269 44 99.0 | 45.7 | 0.18 | 27810 |
| 21.0 | +.0046412 | 3866 | .9021954 | 2122 | .3914912 | 4552 | 270 15 73.3 | 19.9 | 0.11 | 27678 |
| 21.5 | .0133868 | 1318 | .9020957 | 1146 | .3914476 | 4125 | 270 45 107.7 | 54.2 | —0.05 | 27551 |
| 22.0 | .0221310 | :8756 | .9019256 | 9466 | .3913735 | 3393 | 271 16 82.1 | 28.5 | +0.02 | 27430 |
| 22.5 | .0308729 | 6171 | .9016853 | 7084 | .3912690 | 2357 | 271 47 56.5 | 2.8 | 0.09 | 27314 |
| 23.0 | .0396119 | 3557 | .9013749 | 4001 | .3911340 | 1017 | 272 17 90.9 | 37.1 | 0.15 | 27204 |
| 23.5 | .0483475 | 0909 | .9009944 | :0217 | .3909686 | 9373 | 272 48 65.2 | 11.3 | 0.21 | 27099 |
| 24.0 | .0570788 | :8219 | .9005439 | 5733 | .3907728 | 7424 | 273 18 99.5 | 45.5 | 0.27 | 26999 |
| 24.5 | .0658053 | 5481 | .9000235 | 0550 | .3905467 | 5172 | 273 49 73.9 | 19.8 | 0.32 | 26906 |
| 25.0 | .0745263 | 2688 | .8994332 | 4669 | .3902903 | 2618 | 274 19 108.3 | 54.1 | 0.36 | 26819 |
| 25.5 | .0832410 | :9832 | .8987731 | 8089 | .3900037 | :9761 | 274 50 82.6 | 28.3 | 0.40 | 26738 |
| 26.0 | .0919490 | 6910 | .8980433 | 0812 | .3896868 | 6602 | 275 21 56.9 | 2.5 | 0.43 | 26664 |
| 26.5 | .1006495 | 3912 | .8972439 | 2839 | .3893398 | 3141 | 275 51 91.3 | 36.8 | 0.46 | 26598 |
| 27.0 | .1093420 | 0835 | .8963749 | 4171 | .3889626 | 9479 | 276 22 65.7 | 11.1 | 0.48 | 26538 |
| 27.5 | .1180258 | :7671 | .8954363 | 4806 | .3885553 | 5315 | 276 52 100.0 | 45.3 | 0.49 | 26484 |
| 28.0 | .1267002 | 4414 | .8944283 | 4748 | .3881179 | 0951 | 277 23 74.3 | 19.5 | 0.50 | 26437 |
| 28.5 | .1353646 | 1056 | .8933511 | 3997 | .3876505 | 6287 | 277 53 108.7 | 53.8 | 0.49 | 26397 |
| 29.0 | .1440184 | 7593 | .8922047 | 2555 | .3871531 | 1323 | 278 24 83.1 | 28.1 | 0.48 | 26364 |
| 29.5 | .1526611 | 4019 | .8909892 | :0421 | .3866257 | 6059 | 278 55 57.4 | 2.3 | 0.46 | 26338 |
| 30.0 | .1612919 | 0326 | .8897048 | 7599 | .3860684 | 0496 | 279 25 91.7 | 36.5 | 0.44 | 26319 |
| 30.5 | .1699102 | 6508 | .8883514 | 4087 | .3854812 | 4634 | 279 56 66.1 | 10.8 | 0.40 | 26308 |
| 31.0 | .1785154 | 2560 | .8869292 | 9887 | .3848642 | 8474 | 280 26 100 5 | 45.1 | 0.36 | 26304 |
| 31.5 | .1871068 | :8474 | .8854383 | 5000 | .3842175 | 2017 | 280 57 74.9 | 19.4 | 0.32 | 26307 |
| 32.0 | +.1956839 | 4245 | —.8838788 | 9427 | —.3835410 | 5262 | 281 27 109.3 | 53.7 | +0.27 | 26317 |

NOTE.—: denotes a change in the preceding figure.

## MERCURY.

| 1876. | Julian Day. | $x$. | $y$. | $z$. | Log Radius Vector. | Longitude in Orbit. | | $-\frac{k^2}{r^3}x$. | $-\frac{k^2}{r^3}y$. | $-\frac{k^2}{r^3}z$. |
|---|---|---|---|---|---|---|---|---|---|---|
| Jan. 1 | 240<br>6255 | +0.1689 | -0.4056 | -0.0494 | 9.6463 | 293° | 1′.6 | -1.89 | + 4.54 | +0.56 |
| 6 | 6260 | 0.2618 | 0.3261 | 0.0510 | 9.6256 | 309 | 2.0 | 3.39 | 4.21 | 0.66 |
| 11 | 6265 | 0.3287 | 0.2159 | 0.0476 | 9.5984 | 326 | 54.9 | 5.14 | 3.35 | 0.74 |
| 16 | 6270 | 0.3568 | -0.0788 | 0.0386 | 9.5660 | 347 | 27.0 | 6.96 | + 1.53 | 0.75 |
| 21 | 6275 | 0.3322 | +0.0681 | 0.0240 | 9.5316 | 11 | 27.0 | 8.23 | - 1.69 | 0.59 |
| 26 | 6280 | 0.2467 | 0.2012 | -0.0051 | 9.5023 | 39 | 19.6 | 7.47 | 6.10 | +0.15 |
| 31 | 6285 | +0.1064 | 0.2886 | +0.0149 | 9.4882 | 70 | 14.1 | -3.55 | 9.63 | -0.50 |
| Feb. 5 | 6290 | -0.0600 | 0.3050 | 0.0311 | 9.4955 | 101 | 39.1 | +1.89 | 9.68 | 0.99 |
| 10 | 6295 | 0.2130 | 0.2497 | 0.0402 | 9.5209 | 130 | 42.6 | 5.67 | 6.66 | 1.07 |
| 15 | 6300 | 0.3246 | 0.1445 | 0.0413 | 9.5546 | 155 | 59.1 | 6.85 | 3.05 | 0.88 |
| 20 | 6305 | 0.3851 | +0.0154 | 0.0358 | 9.5882 | 177 | 34.8 | 6.44 | - 0.26 | 0.60 |
| 25 | 6310 | 0.3969 | -0.1162 | 0.0257 | 9.6173 | 196 | 14.7 | 5.44 | + 1.59 | 0.35 |
| March 1 | 6315 | 0.3675 | 0.2364 | +0.0129 | 9.6402 | 212 | 47.5 | 4.29 | 2.77 | -0.16 |
| 6 | 6320 | 0.3055 | 0.3356 | -0.0010 | 9.6565 | 227 | 54.6 | 3.19 | 3.50 | +0.01 |
| 11 | 6325 | 0.2192 | 0.4085 | 0.0149 | 9.6660 | 242 | 9.3 | 2.14 | 3.99 | 0.15 |
| 16 | 6330 | 0.1166 | 0.4511 | 0.0277 | 9.6690 | 255 | 59.6 | 1.12 | 4.32 | 0.26 |
| 21 | 6335 | -0.0054 | 0.4610 | 0.0384 | 9.6655 | 269 | 50.5 | +0.06 | 4.52 | 0.37 |
| 26 | 6340 | +0.1061 | 0.4365 | 0.0464 | 9.6555 | 284 | 8.5 | -1.11 | 4.59 | 0.49 |
| 31 | 6345 | 0.2090 | 0.3773 | 0.0506 | 9.6387 | 299 | 20.8 | 2.47 | 4.45 | 0.60 |
| April 5 | 6350 | 0.2927 | 0.2844 | 0.0503 | 9.6153 | 316 | 1.7 | 4.07 | 3.95 | 0.70 |
| 10 | 6355 | 0.3457 | 0.1619 | 0.0446 | 9.5858 | 334 | 53.2 | 5.89 | 2.76 | 0.76 |
| 15 | 6360 | 0.3539 | -0.0193 | 0.0333 | 9.5520 | 356 | 44.3 | 7.61 | + 0.42 | 0.72 |
| 20 | 6365 | 0.3051 | +0.1255 | -0.0167 | 9.5186 | 22 | 18.7 | 8.26 | - 3.40 | +0.45 |
| 25 | 6370 | 0.1952 | 0.2440 | +0.0032 | 9.4942 | 51 | 37.3 | 6.25 | 7.82 | -0.10 |
| 30 | 6375 | +0.0396 | 0.3046 | 0.0222 | 9.4885 | 83 | 6.7 | -1.31 | 10.15 | 0.75 |
| May 5 | 6380 | -0.1257 | 0.2904 | 0.0358 | 9.5042 | 113 | 51.6 | +3.75 | 8.69 | 1.07 |
| 10 | 6385 | 0.2643 | 0.2115 | 0.0416 | 9.5341 | 141 | 27.0 | 6.42 | 5.14 | 1.01 |
| 15 | 6390 | 0.3559 | +0.0926 | 0.0397 | 9.5686 | 165 | 9.7 | 6.80 | - 1.77 | 0.76 |
| 20 | 6395 | 0.3954 | -0.0388 | 0.0321 | 9.6007 | 185 | 27.9 | 6.07 | + 0.59 | 0.49 |
| 25 | 6400 | 0.3895 | 0.1670 | 0.0207 | 9.6274 | 203 | 10.7 | 4.97 | 2.13 | 0.26 |
| 30 | 6405 | 0.3458 | 0.2795 | +0.0074 | 9.6476 | 219 | 4.2 | 3.84 | 3.10 | -0.08 |
| June 4 | 6410 | 0.2728 | 0.3687 | -0.0068 | 9.6611 | 233 | 46.3 | 2.76 | 3.72 | +0.06 |
| 9 | 6415 | 0.1789 | 0.4296 | 0.0203 | 9.6680 | 247 | 48.0 | 1.73 | 4.14 | 0.19 |
| 14 | 6420 | -0.0718 | 0.4592 | 0.0324 | 9.6684 | 261 | 35.6 | +0.69 | 4.42 | 0.31 |
| 19 | 6425 | +0.0403 | 0.4554 | 0.0421 | 9.6622 | 275 | 34.4 | -0.41 | 4.57 | 0.42 |
| 24 | 6430 | 0.1494 | 0.4168 | 0.0486 | 9.6495 | 290 | 10.6 | 1.64 | 4.56 | 0.54 |
| 29 | 6435 | 0.2459 | 0.3436 | 0.0511 | 9.6300 | 305 | 54.3 | 3.08 | 4.31 | 0.64 |
| July 4 | 6440 | 0.3188 | 0.2380 | 0.0486 | 9.6040 | 323 | 22.7 | 4.78 | 3.57 | 0.73 |
| 9 | 6445 | 0.3552 | -0.1057 | 0.0408 | 9.5724 | 343 | 21.0 | 6.63 | + 1.97 | 0.76 |
| 14 | 6450 | 0.3415 | +0.0406 | 0.0272 | 9.5379 | 6 | 38.7 | 8.09 | - 0.96 | 0.64 |
| 19 | 6455 | 0.2675 | 0.1787 | -0.0089 | 9.4070 | 33 | 48.3 | 7.84 | 5.23 | +0.25 |
| 24 | 6460 | +0.1358 | 0.2771 | +0.0115 | 9.4893 | 64 | 17.6 | -4.50 | 9.18 | -0.38 |
| 29 | 6465 | -0.0285 | 0.3077 | 0.0286 | 9.4925 | 95 | 51.2 | +0.93 | 9.97 | 0.92 |
| Aug. 3 | 6470 | 0.1869 | 0.2649 | 0.0391 | 9.5152 | 125 | 31.3 | 5.18 | 7.34 | 1.09 |
| 8 | 6475 | 0.3072 | 0.1668 | 0.0417 | 9.5481 | 151 | 32.1 | 6.79 | 3.68 | 0.92 |
| 13 | 6480 | 0.3776 | +0.0404 | 0.0372 | 9.5821 | 173 | 46.4 | 6.59 | - 0.71 | 0.65 |
| 18 | 6485 | 0.3981 | -0.0921 | 0.0279 | 9.6123 | 192 | 55.5 | 5.64 | + 1.30 | 0.40 |
| 23 | 6490 | 0.3758 | 0.2151 | 0.0155 | 9.6364 | 209 | 48.8 | 4.50 | 2.58 | 0.19 |
| 28 | 6495 | 0.3193 | 0.3188 | +0.0016 | 9.6539 | 225 | 9.2 | 3.39 | 3.39 | -0.01 |
| Sept. 2 | 6500 | 0.2365 | 0.3970 | -0.0123 | 9.6647 | 239 | 31.5 | 2.34 | 3.91 | +0.12 |
| 7 | 6505 | 0.1366 | 0.4455 | 0.0255 | 9.6690 | 253 | 24.4 | 1.31 | 4.27 | 0.24 |
| 12 | 6510 | -0.0265 | -0.4617 | -0.0366 | 9.6667 | 267 | 13.5 | +0.26 | + 4.50 | +0.36 |

Note.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

## MERCURY.

| 1876. | | Julian Day. | $x.$ | $y.$ | $z.$ | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x.$ | $-\frac{\kappa^2}{r^3}y.$ | $-\frac{\kappa^2}{r^3}z.$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 240 | | | | | | | | |
| Sept. | 17 | 6515 | +0.0856 | -0.4439 | -0.0452 | 9.6579 | 281° 24′.1 | -0.88 | + 4.60 | +0.47 |
| | 22 | 6520 | 0.1907 | 0.3910 | 0.0502 | 9.6424 | 296 23.8 | 2.20 | 4.50 | 0.58 |
| | 27 | 6525 | 0.2791 | 0.3042 | 0.0508 | 9.6202 | 312 45.1 | 3.74 | 4.08 | 0.68 |
| Oct. | 2 | 6530 | 0.3387 | 0.1870 | 0.0461 | 9.5917 | 331 8.5 | 5.53 | 3.06 | 0.75 |
| | 7 | 6535 | 0.3564 | -0.0478 | 0.0359 | 9.5585 | 352 22.0 | 7.32 | + 0.96 | 0.74 |
| | 12 | 6540 | 0.3189 | +0.0995 | 0.0202 | 9.5245 | 17 12.3 | 8.29 | - 2.59 | 0.52 |
| | 17 | 6545 | 0.2200 | 0.2253 | -0.0007 | 9.4976 | 45 52.6 | 6.89 | 7.05 | +0.02 |
| | 22 | 6550 | +0.0710 | 0.2987 | +0.0189 | 9.4879 | 77 9.4 | -2.38 | 9.99 | -0.64 |
| | 27 | 6555 | -0.0957 | 0.2984 | 0.0338 | 9.4998 | 108 16.4 | +2.95 | 9.20 | 1.04 |
| Nov. | 1 | 6560 | 0.2414 | 0.2302 | 0.0411 | 9.5279 | 136 33.9 | 6.13 | 5.85 | 1.04 |
| | 6 | 6565 | 0.3422 | +0.1174 | 0.0406 | 9.5621 | 160 59.6 | 6.86 | - 2.35 | 0.82 |
| | 11 | 6570 | 0.3916 | -0.0138 | 0.0339 | 9.5950 | 181 52.6 | 6.25 | + 0.21 | 0.54 |
| | 16 | 6575 | 0.3938 | 0.1439 | 0.0231 | 9.6229 | 200 0.8 | 5.19 | 1.89 | 0.30 |
| | 21 | 6580 | 0.3566 | 0.2600 | +0.0100 | 9.6444 | 216 11.7 | 4.04 | 2.95 | -0.11 |
| | 26 | 6585 | 0.2884 | 0.3539 | -0.0041 | 9.6591 | 231 4.7 | 2.96 | 3.62 | +0.05 |
| Dec. | 1 | 6590 | 0.1978 | 0.4205 | 0.0178 | 9.6672 | 245 11.9 | 1.92 | 4.07 | 0.18 |
| | 6 | 6595 | -0.0926 | 0.4560 | 0.0303 | 9.6688 | 259 0.2 | +0.89 | 4.38 | 0.29 |
| | 11 | 6600 | +0.0192 | 0.4586 | 0.0405 | 9.6639 | 272 55.0 | -0.18 | 4.55 | 0.40 |
| | 16 | 6605 | 0.1297 | 0.4265 | 0.0477 | 9.6524 | 287 22.0 | 1.39 | 4.58 | 0.51 |
| | 21 | 6610 | 0.2292 | 0.3598 | 0.0509 | 9.6342 | 302 50 5 | 2.80 | 4.38 | 0.62 |
| | 26 | 6615 | 0.3075 | 0.2600 | 0.0495 | 9.6094 | 319 56.0 | 4.45 | 3.76 | 0.71 |
| | 31 | 6620 | 0.3517 | -0.1321 | 0.0426 | 9.5787 | 339 22.3 | 6.29 | + 2.37 | 0.76 |
| | 36 | 6625 | +0.3484 | +0.0129 | -0.0301 | 9.5444 | 1 59.1 | -7.89 | - 0.29 | +0.68 |

## VENUS.

| 1876. | | Julian Day. | $x.$ | $y.$ | $z.$ | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x.$ | $-\frac{\kappa^2}{r^3}y.$ | $-\frac{\kappa^2}{r^3}z.$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 240 | | | | | | | | |
| Jan. | 1 | 6255 | +0.6810 | -0.2526 | -0.0428 | 9.8619 | 339° 39′.5 | -21.47 | + 7.96 | +1.35 |
| | 6 | 6260 | 0.7090 | 0.1561 | 0.0430 | 9.8616 | 347 34.7 | 22.38 | 4.93 | 1.36 |
| | 11 | 6265 | 0.7233 | -0.0566 | 0.0424 | 9.8614 | 355 30.6 | 22.68 | + 1.79 | 1.34 |
| | 16 | 6270 | 0.7237 | +0.0441 | 0.0409 | 9.8611 | 3 27.2 | 22.94 | - 1.40 | 1.30 |
| | 21 | 6275 | 0.7102 | 0.1438 | 0.0386 | 9.8607 | 11 24.3 | 22.56 | 4.59 | 1.23 |
| | 26 | 6280 | 0.6829 | 0.2408 | 0.0356 | 9.8603 | 19 22.3 | 21.76 | 7.67 | 1.14 |
| | 31 | 6285 | 0.6424 | 0.3331 | 0.0319 | 9.8599 | 27 21 2 | 20.52 | 10.64 | 1.02 |
| Feb. | 5 | 6290 | 0.5894 | 0.4189 | 0.0276 | 9.8595 | 35 21.0 | 18.88 | 13.42 | 0.89 |
| | 10 | 6295 | 0.5250 | 0.4965 | 0.0228 | 9.8591 | 43 21.6 | 16.87 | 15.95 | 0.73 |
| | 15 | 6300 | 0.4503 | 0.5645 | 0.0175 | 9.8587 | 51 23.1 | 14.51 | 18.20 | 0.56 |
| | 20 | 6305 | 0.3667 | 0.6214 | 0.0118 | 9.8583 | 59 25.6 | 11.85 | 20.07 | 0.38 |
| | 25 | 6310 | 0.2760 | 0.6662 | -0.0060 | 9.8580 | 67 29.0 | 8.94 | 21.57 | +0.19 |
| March | 1 | 6315 | 0.1797 | 0.6976 | 0.0000 | 9.8576 | 75 33.1 | 5.84 | 22.66 | 0.00 |
| | 6 | 6320 | +0.0800 | 0.7154 | +0.0060 | 9.8573 | 83 38.0 | - 2.60 | 23.28 | -0.20 |
| | 11 | 6325 | -0.0213 | 0.7190 | 0.0119 | 9.8570 | 91 43.6 | + 0.70 | 23.44 | 0.39 |
| | 16 | 6330 | 0.1222 | 0.7084 | 0.0175 | 9.8568 | 99 49.7 | 3.99 | 23.13 | 0.57 |
| | 21 | 6335 | 0.2208 | 0.6836 | 0.0228 | 9.8566 | 107 56.3 | 7.22 | 22.36 | 0.75 |
| | 26 | 6340 | 0.3148 | 0.6453 | 0.0276 | 9.8564 | 116 3.3 | 10.30 | 21.11 | 0.90 |
| | 31 | 6345 | 0.4027 | 0.5941 | 0.0319 | 9.8564 | 124 10.5 | 13.18 | 19.45 | 1.04 |
| April | 5 | 6350 | 0.4825 | 0.5311 | 0.0356 | 9.8564 | 132 17.8 | 15.80 | 17.39 | 1.16 |
| | 10 | 6355 | 0.5526 | 0.4575 | 0.0385 | 9.8564 | 140 24.9 | 18.09 | 14.98 | 1.26 |
| | 15 | 6360 | 0.6118 | 0.3749 | 0.0407 | 9.8565 | 148 31.8 | 20.01 | 12.26 | 1.33 |
| | 20 | 6365 | -0.6588 | +0.2847 | +0.0420 | 9.8567 | 156 38.6 | +21.53 | - 9.30 | -1.37 |

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

## VENUS.

| 1876. | | Julian Day. | $x.$ | $y.$ | $z.$ | Log Radius Vector. | Longitude in Orbit. | | $-\frac{\kappa^2}{r^3}x.$ | $-\frac{\kappa^2}{r^3}y.$ | $-\frac{\kappa^2}{r^3}z.$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| April | 25 | 240<br>6370 | -0.6927 | +0.1889 | +0.0426 | 9.8569 | 164° | 45.0' | +22.60 | - 6.16 | -1.39 |
| | 30 | 6375 | 0.7129 | +0.0893 | 0.0423 | 9.8572 | 172 | 50.7 | 23.21 | - 2.91 | 1.37 |
| May | 5 | 6380 | 0.7190 | -0.0120 | 0.0411 | 9.8575 | 180 | 55.7 | 23.36 | + 0.39 | 1.33 |
| | 10 | 6385 | 0.7108 | 0.1131 | 0.0391 | 9.8578 | 189 | 0.2 | 23.04 | 3.67 | 1.27 |
| | 15 | 6390 | 0.6886 | 0.2120 | 0.0364 | 9.8582 | 197 | 3.9 | 22.26 | 6.85 | 1.18 |
| | 20 | 6395 | 0.6529 | 0.3067 | 0.0329 | 9.8586 | 205 | 6.6 | 21.05 | 9.89 | 1.06 |
| | 25 | 6400 | 0.6044 | 0.3953 | 0.0288 | 9.8590 | 213 | 8.4 | 19.43 | 12.72 | 0.93 |
| | 30 | 6405 | 0.5440 | 0.4763 | 0.0242 | 9.8594 | 221 | 9.4 | 17.44 | 15.28 | 0.77 |
| June | 4 | 6410 | 0.4730 | 0.5480 | 0.0190 | 9.8598 | 229 | 9.5 | 15.12 | 17.52 | 0.61 |
| | 9 | 6415 | 0.3928 | 0.6089 | 0.0135 | 9.8602 | 237 | 8.6 | 12.52 | 19.42 | 0.43 |
| | 14 | 6420 | 0.3050 | 0.6581 | 0.0078 | 9.8606 | 245 | 6.8 | 9.70 | 20.93 | 0.25 |
| | 19 | 6425 | 0.2113 | 0.6946 | +0.0018 | 9.8610 | 253 | 4.3 | 6.70 | 22.03 | -0.06 |
| | 24 | 6430 | 0.1135 | 0.7176 | -0.0041 | 9.8613 | 261 | 1.1 | 3.59 | 22.71 | +0.13 |
| | 29 | 6435 | -0.0136 | 0.7269 | 0.0100 | 9.8616 | 268 | 57.0 | + 0.43 | 22.96 | 0.32 |
| July | 4 | 6440 | +0.0866 | 0.7221 | 0.0157 | 9.8618 | 276 | 52.4 | - 2.73 | 22.77 | 0.49 |
| | 9 | 6445 | 0.1852 | 0.7035 | 0.0210 | 9.8620 | 284 | 47.4 | 5.83 | 22.15 | 0.66 |
| | 14 | 6450 | 0.2802 | 0.6714 | 0.0260 | 9.8622 | 292 | 42.0 | 8.82 | 21.12 | 0.82 |
| | 19 | 6455 | 0.3699 | 0.6265 | 0.0305 | 9.8623 | 300 | 36.3 | 11.62 | 19.70 | 0.96 |
| | 24 | 6460 | 0.4524 | 0.5696 | 0.0344 | 9.8623 | 308 | 30.4 | 14.22 | 17.91 | 1.08 |
| | 29 | 6465 | 0.5264 | 0.5018 | 0.0377 | 9.8623 | 316 | 24.6 | 16.55 | 15.78 | 1.18 |
| Aug. | 3 | 6470 | 0.5903 | 0.4244 | 0.0402 | 9.8622 | 324 | 18.9 | 18.56 | 13.35 | 1.26 |
| | 8 | 6475 | 0.6428 | 0.3389 | 0.0419 | 9.8621 | 332 | 13.3 | 20.23 | 10.67 | 1.32 |
| | 13 | 6480 | 0.6831 | 0.2469 | 0.0429 | 9.8619 | 340 | 8.1 | 21.53 | 7.78 | 1.35 |
| | 18 | 6485 | 0.7102 | 0.1502 | 0.0430 | 9.8617 | 348 | 3.4 | 22.42 | 4.74 | 1.36 |
| | 23 | 6490 | 0.7238 | -0.0505 | 0.0423 | 9.8614 | 355 | 59.2 | 22.89 | + 1.60 | 1.34 |
| | 28 | 6495 | 0.7233 | +0.0500 | 0.0408 | 9.8611 | 3 | 55.6 | 22.93 | - 1.59 | 1.29 |
| Sept. | 2 | 6500 | 0.7090 | 0.1497 | 0.0385 | 9.8607 | 11 | 52.7 | 22.52 | 4.75 | 1.22 |
| | 7 | 6505 | 0.6809 | 0.2464 | 0.0354 | 9.8603 | 19 | 50.8 | 21.69 | 7.85 | 1.13 |
| | 12 | 6510 | 0.6396 | 0.3384 | 0.0317 | 9.8599 | 27 | 49.8 | 20.43 | 10.81 | 1.01 |
| | 17 | 6515 | 0.5860 | 0.4238 | 0.0274 | 9.8595 | 35 | 49.5 | 18.77 | 13.57 | 0.88 |
| | 22 | 6520 | 0.5208 | 0.5009 | 0.0225 | 9.8591 | 43 | 50.1 | 16.73 | 16.09 | 0.72 |
| | 27 | 6525 | 0.4455 | 0.5682 | 0.0171 | 9.8587 | 51 | 51.7 | 14.35 | 18.30 | 0.55 |
| Oct. | 2 | 6530 | 0.3615 | 0.6244 | 0.0115 | 9.8583 | 59 | 54.3 | 11.68 | 20.17 | 0.37 |
| | 7 | 6535 | 0.2704 | 0.6683 | -0.0056 | 9.8579 | 67 | 57.6 | 8.76 | 21.65 | +0.18 |
| | 12 | 6540 | 0.1740 | 0.6991 | +0.0004 | 9.8576 | 76 | 1.6 | 5.65 | 22.70 | -0.01 |
| | 17 | 6545 | +0.0739 | 0.7160 | 0.0064 | 9.8573 | 84 | 6.6 | - 2.41 | 23.30 | 0.21 |
| | 22 | 6550 | -0.0273 | 0.7188 | 0.0122 | 9.8570 | 92 | 12.3 | + 0.89 | 23.43 | 0.40 |
| | 27 | 6555 | 0.1281 | 0.7073 | 0.0178 | 9.8567 | 100 | 18.4 | 4.18 | 23.10 | 0.58 |
| Nov. | 1 | 6560 | 0.2264 | 0.6817 | 0.0231 | 9.8566 | 108 | 24.9 | 7.40 | 22.29 | 0.76 |
| | 6 | 6565 | 0.3202 | 0.6426 | 0.0279 | 9.8564 | 116 | 32.0 | 10.48 | 21.03 | 0.91 |
| | 11 | 6570 | 0.4076 | 0.5907 | 0.0322 | 9.8564 | 124 | 39.2 | 13.35 | 19.34 | 1.05 |
| | 16 | 6575 | 0.4868 | 0.5271 | 0.0358 | 9.8564 | 132 | 46.4 | 15.94 | 17.26 | 1.17 |
| | 21 | 6580 | 0.5564 | 0.4529 | 0.0387 | 9.8564 | 140 | 53.6 | 18.22 | 14.83 | 1.27 |
| | 26 | 6585 | 0.6149 | 0.3697 | 0.0408 | 9.8565 | 149 | 0.7 | 20.11 | 12.09 | 1.34 |
| Dec. | 1 | 6590 | 0.6612 | 0.2791 | 0.0421 | 9.8567 | 157 | 7.5 | 21.60 | 9.12 | 1.38 |
| | 6 | 6595 | 0.6943 | 0.1831 | 0.0426 | 9.8569 | 165 | 13.7 | 22.65 | 5.97 | 1.39 |
| | 11 | 6600 | 0.7136 | +0.0834 | 0.0422 | 9.8572 | 173 | 19.3 | 23.24 | - 2.71 | 1.37 |
| | 16 | 6605 | 0.7188 | -0.0180 | 0.0410 | 9.8575 | 181 | 24.6 | 23.35 | + 0.59 | 1.33 |
| | 21 | 6610 | 0.7098 | 0.1191 | 0.0390 | 9.8578 | 189 | 29.1 | 23.01 | 3.86 | 1.26 |
| | 26 | 6615 | 0.6868 | 0.2177 | 0.0362 | 9.8582 | 197 | 32.6 | 22.20 | 7.04 | 1.17 |
| | 31 | 6620 | 0.6503 | 0.3121 | 0.0327 | 9.8586 | 205 | 35.3 | 20.97 | 10.07 | 1.05 |
| | 36 | 6625 | -0.6010 | -0.4004 | +0.0286 | 9.8590 | 213 | 37.2 | +19.33 | +12.87 | -0.92 |

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

## THE EARTH.

| 1876. | Julian Day. | $x$. | $y$. | $z$. | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x$. | $-\frac{\kappa^2}{r^3}y$. | $-\frac{\kappa^2}{r^3}z$. |
|---|---|---|---|---|---|---|---|---|---|
|  | 240<br>6250 | -0.0952 | +0.9788 | 0.0000 | 9.9927 | 95° 33′.6 | + 1.34 | -13.74 | 0.00 |
| Jan. 6 | 6260 | 0.2670 | 0.9465 |  | 9.9927 | 105 45.3 | 3.75 | 13.28 |  |
| 16 | 6270 | 0.4303 | 0.8847 |  | 9.9929 | 115 56.5 | 6.03 | 12.38 |  |
| 26 | 6280 | 0.5805 | 0.7956 |  | 9.9934 | 126 6.8 | 8.11 | 11.10 |  |
| Feb. 5 | 6290 | 0.7125 | 0.6819 |  | 9.9940 | 136 15.8 | 9.91 | 9.48 |  |
| 15 | 6300 | 0.8228 | 0.5475 |  | 9.9948 | 146 22.3 | 11.38 | 7.57 |  |
| 25 | 6310 | 0.9078 | 0.3958 |  | 9.9958 | 156 26.6 | 12.47 | 5.44 |  |
| March 6 | 6320 | 0.9654 | 0.2323 |  | 9.9969 | 166 28.3 | 13.16 | 3.17 |  |
| 16 | 6330 | 0.9938 | +0.0619 |  | 9.9981 | 176 26.3 | 13.44 | - 0.84 |  |
| 26 | 6340 | 0.9922 | -0.1105 |  | 9.9993 | 186 21.1 | 13.30 | + 1.48 |  |
| April 5 | 6350 | 0.9616 | 0.2796 |  | 0.0006 | 196 12.6 | 12.78 | 3.72 |  |
| 15 | 6360 | 0.9027 | 0.4404 |  | 0.0018 | 206 0.7 | 11.89 | 5.80 |  |
| 25 | 6370 | 0.8172 | 0.5884 |  | 0.0030 | 215 45.5 | 10.68 | 7.69 |  |
| May 5 | 6380 | 0.7080 | 0.7193 |  | 0.0040 | 225 27.3 | 9.19 | 9.34 |  |
| 15 | 6390 | 0.5786 | 0.8297 |  | 0.0050 | 235 6.4 | 7.46 | 10.70 |  |
| 25 | 6400 | 0.4328 | 0.9165 |  | 0.0058 | 244 43.1 | 5.55 | 11.75 |  |
| June 4 | 6410 | 0.2747 | 0.9770 |  | 0.0064 | 254 17.9 | 3.51 | 12.47 |  |
| 14 | 6420 | -0.1088 | 1.0102 |  | 0.0069 | 263 51.2 | + 1.39 | 12.85 |  |
| 24 | 6430 | +0.0602 | 1.0149 |  | 0.0072 | 273 23.6 | - 0.75 | 12.89 |  |
| July 4 | 6440 | 0.2273 | 0.9911 |  | 0.0072 | 282 55.5 | 2.88 | 12.58 |  |
| 14 | 6450 | 0.3883 | 0.9393 |  | 0.0071 | 292 27.5 | 4.94 | 11.94 |  |
| 24 | 6460 | 0.5383 | 0.8612 |  | 0.0067 | 302 0.3 | 6.86 | 10.97 |  |
| Aug. 3 | 6470 | 0.6731 | 0.7590 |  | 0.0062 | 311 34.2 | 8.60 | 9.70 |  |
| 13 | 6480 | 0.7889 | 0.6352 |  | 0.0055 | 321 9.7 | 10.13 | 8.16 |  |
| 23 | 6490 | 0.8821 | 0.4932 |  | 0.0046 | 330 47.4 | 11.40 | 6.37 |  |
| Sept. 2 | 6500 | 0.9502 | 0.3372 |  | 0.0036 | 340 27.7 | 12.37 | 4.39 |  |
| 12 | 6510 | 0.9911 | 0.1715 |  | 0.0025 | 350 10.9 | 13.00 | 2.25 |  |
| 22 | 6520 | 1.0030 | -0.0008 |  | 0.0013 | 359 57.2 | 13.26 | + 0.01 |  |
| Oct. 2 | 6530 | 0.9854 | +0.1698 |  | 0.0000 | 9 46.7 | 13.15 | - 2.27 |  |
| 12 | 6540 | 0.9389 | 0.3354 |  | 9.9987 | 19 39.6 | 12.64 | 4.52 |  |
| 22 | 6550 | 0.8646 | 0.4911 |  | 9.9975 | 29 36.0 | 11.74 | 6.67 |  |
| Nov. 1 | 6560 | 0.7642 | 0.6321 |  | 9.9964 | 39 35.8 | 10.46 | 8.65 |  |
| 11 | 6570 | 0.6406 | 0.7537 |  | 9.9953 | 49 38.6 | 8.83 | 10.39 |  |
| 21 | 6580 | 0.4975 | 0.8527 |  | 9.9944 | 59 44.1 | 6.90 | 11.83 |  |
| Dec. 1 | 6590 | 0.3392 | 0.9251 |  | 9.9936 | 69 51.8 | 4.73 | 12.90 |  |
| 11 | 6600 | +0.1705 | 0.9694 |  | 9.9931 | 80 1.4 | - 2.39 | 13.57 |  |
| 21 | 6610 | -0.0035 | 0.9833 |  | 9.9928 | 90 12.4 | + 0.05 | 13.79 |  |
| 31 | 6620 | -0.1774 | +0.9670 | 0.0000 | 9.9926 | 100 23.9 | + 2.49 | -13.58 | 0.00 |

## MARS.

| 1876. | Julian Day. | $x$. | $y$. | $z$. | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x$. | $-\frac{\kappa^2}{r^3}y$. | $-\frac{\kappa^2}{r^3}z$. |
|---|---|---|---|---|---|---|---|---|---|
|  | 240<br>6250 | +1.2861 | +0.6213 | -0.0179 | 0.1549 | 25° 46′.5 | -0.78 | -0.38 | +0.01 |
| Jan. 6 | 6260 | 1.2246 | 0.7556 | 0.0137 | 0.1581 | 31 40.1 | 0.73 | 0.45 | 0.01 |
| 16 | 6270 | 1.1510 | 0.8825 | 0.0091 | 0.1615 | 37 28.3 | 0.67 | 0.51 | +0.01 |
| 26 | 6280 | 1.0663 | 1.0008 | -0.0044 | 0.1651 | 43 10.9 | 0.60 | 0.56 | 0.00 |
| Feb. 5 | 6290 | 0.9715 | 1.1097 | +0.0002 | 0.1688 | 48 47.9 | 0.53 | 0.61 | 0.00 |
| 15 | 6300 | 0.8678 | 1.2083 | 0.0048 | 0.1725 | 54 19.1 | 0.47 | 0.65 | 0.00 |
| 25 | 6310 | 0.7562 | 1.2961 | 0.0094 | 0.1763 | 59 44.7 | 0.40 | 0.68 | 0.00 |
| March 6 | 6320 | +0.6380 | +1.3726 | +0.0139 | 0.1800 | 65 4.7 | -0.33 | -0.70 | -0.01 |

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

## MARS.

| 1876. | Julian Day. | $x.$ | $y.$ | $z.$ | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x.$ | $-\frac{\kappa^2}{r^3}y.$ | $-\frac{\kappa^2}{r^3}z.$ |
|---|---|---|---|---|---|---|---|---|---|
| | **240** | | | | | | | | |
| March 16 | 6330 | +0.5144 | +1.4374 | +0.0183 | 0.1837 | 70° 19′.2 | −0.26 | −0.71 | −0.01 |
| 26 | 6340 | 0.3865 | 1.4902 | 0.0225 | 0.1873 | 75 28.4 | 0.19 | 0.72 | 0.01 |
| April 5 | 6350 | 0.2554 | 1.5309 | 0.0266 | 0.1909 | 80 32.5 | 0.12 | 0.72 | 0.01 |
| 15 | 6360 | +0.1223 | 1.5594 | 0.0304 | 0.1943 | 85 31.8 | −0.06 | 0.72 | 0.01 |
| 25 | 6370 | −0.0116 | 1.5760 | 0.0340 | 0.1976 | 90 26.4 | 0.00 | 0.71 | 0.02 |
| May 5 | 6380 | 0.1455 | 1.5808 | 0.0374 | 0.2007 | 95 16.7 | +0.06 | 0.70 | 0.02 |
| 15 | 6390 | 0.2785 | 1.5739 | 0.0404 | 0.2036 | 100 3.0 | 0.12 | 0.68 | 0.02 |
| 25 | 6400 | 0.4094 | 1.5555 | 0.0432 | 0.2064 | 104 45.6 | 0.17 | 0.66 | 0.02 |
| June 4 | 6410 | 0.5373 | 1.5259 | 0.0457 | 0.2089 | 109 24.7 | 0.22 | 0.64 | 0.02 |
| 14 | 6420 | 0.6615 | 1.4858 | 0.0478 | 0.2112 | 114 0.6 | 0.27 | 0.61 | 0.02 |
| 24 | 6430 | 0.7811 | 1.4356 | 0.0496 | 0.2133 | 118 33.7 | 0.32 | 0.58 | 0.02 |
| July 4 | 6440 | 0.8956 | 1.3756 | 0.0510 | 0.2152 | 123 4.4 | 0.36 | 0.55 | 0.02 |
| 14 | 6450 | 1.0040 | 1.3064 | 0.0523 | 0.2168 | 127 32.8 | 0.40 | 0.52 | 0.02 |
| 24 | 6460 | 1.1057 | 1.2286 | 0.0531 | 0.2182 | 131 59.4 | 0.43 | 0.48 | 0.02 |
| Aug. 3 | 6470 | 1.2002 | 1.1428 | 0.0535 | 0.2194 | 136 24.4 | 0.46 | 0.44 | 0.02 |
| 13 | 6480 | 1.2870 | 1.0495 | 0.0536 | 0.2203 | 140 48.2 | 0.49 | 0.40 | 0.02 |
| 23 | 6490 | 1.3654 | 0.9494 | 0.0534 | 0.2209 | 145 11.0 | 0.52 | 0.36 | 0.02 |
| Sept. 2 | 6500 | 1.4351 | 0.8433 | 0.0528 | 0.2213 | 149 33.3 | 0.55 | 0.32 | 0.02 |
| 12 | 6510 | 1.4955 | 0.7318 | 0.0519 | 0.2214 | 153 55.2 | 0.57 | 0.28 | 0.02 |
| 22 | 6520 | 1.5465 | 0.6156 | 0.0507 | 0.2213 | 158 17.2 | 0.59 | 0.24 | 0.02 |
| Oct. 2 | 6530 | 1.5876 | 0.4954 | 0.0491 | 0.2209 | 162 39.4 | 0.61 | 0.19 | 0.02 |
| 12 | 6540 | 1.6184 | 0.3721 | 0.0473 | 0.2203 | 167 2.3 | 0.62 | 0.14 | 0.02 |
| 22 | 6550 | 1.6388 | 0.2464 | 0.0450 | 0.2194 | 171 26.2 | 0.63 | 0.10 | 0.02 |
| Nov. 1 | 6560 | 1.6485 | +0.1190 | 0.0425 | 0.2182 | 175 51.3 | 0.64 | −0.05 | 0.02 |
| 11 | 6570 | 1.6474 | −0.0091 | 0.0397 | 0.2168 | 180 18.0 | 0.65 | 0.00 | 0.02 |
| 21 | 6580 | 1.6355 | 0.1371 | 0.0366 | 0.2152 | 184 46.6 | 0.65 | +0.05 | 0.01 |
| Dec. 1 | 6590 | 1.6127 | 0.2642 | 0.0334 | 0.2133 | 189 17.4 | 0.65 | 0.11 | 0.01 |
| 11 | 6600 | 1.5789 | 0.3896 | 0.0299 | 0.2112 | 193 50.8 | 0.65 | 0.16 | 0.01 |
| 21 | 6610 | 1.5342 | 0.5123 | 0.0262 | 0.2088 | 198 27.0 | 0.64 | 0.21 | 0.01 |
| 31 | 6620 | −1.4789 | −0.6314 | +0.0224 | 0.2063 | 203 6.4 | +0.63 | +0.27 | −0.01 |

## JUPITER.

| 1876. | Julian Day. | $x.$ | $y.$ | $z.$ | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x.$ | $-\frac{\kappa^2}{r^3}y.$ | $-\frac{\kappa^2}{r^3}z.$ |
|---|---|---|---|---|---|---|---|---|---|
| | **240** | | | | | | | | |
| | 6250 | −3.75091 | −3.90057 | +0.09884 | 0.73339 | 226° 6′ 48″ | +106.89 | +111.16 | −2.82 |
| Jun. 6 | 6260 | 3.69698 | 3.94899 | 0.09780 | 0.73322 | 226 52 50 | 105.48 | 112.67 | 2.79 |
| 16 | 6270 | 3.64237 | 3.99668 | 0.09674 | 0.73306 | 227 38 54 | 104.03 | 114.15 | 2.76 |
| 26 | 6280 | 3.58707 | 4.04363 | 0.09567 | 0.73289 | 228 25 0 | 102.57 | 115.63 | 2.74 |
| Feb. 5 | 6290 | 3.53110 | 4.08982 | 0.09457 | 0.73272 | 229 11 8 | 101.09 | 117.09 | 2.71 |
| 15 | 6300 | 3.47448 | 4.13523 | 0.09346 | 0.73255 | 229 57 18 | 99.59 | 118.53 | 2.68 |
| 25 | 6310 | 3.41720 | 4.17986 | 0.09232 | 0.73237 | 230 43 31 | 98.07 | 119.95 | 2.65 |
| March 6 | 6320 | 3.35927 | 4.22370 | 0.09116 | 0.73219 | 231 29 45 | 96.53 | 121.36 | 2.62 |
| 16 | 6330 | 3.30072 | 4.26675 | 0.09000 | 0.73201 | 232 16 2 | 94.96 | 122.75 | 2.59 |
| 26 | 6340 | 3.24155 | 4.30899 | 0.08882 | 0.73182 | 233 2 21 | 93.38 | 124.13 | 2.56 |
| April 5 | 6350 | 3.18177 | 4.35043 | 0.08762 | 0.73163 | 233 48 43 | 91.78 | 125.49 | 2.53 |
| 15 | 6360 | 3.12138 | 4.39104 | 0.08640 | 0.73144 | 234 35 7 | 90.16 | 126.83 | 2.50 |
| 25 | 6370 | 3.06040 | 4.43083 | 0.08516 | 0.73124 | 235 21 34 | 88.52 | 128.15 | 2.47 |
| May 5 | 6380 | 2.99883 | 4.46977 | 0.08390 | 0.73104 | 236 8 3 | 86.86 | 129.46 | 2.44 |
| 15 | 6390 | −2.93670 | −4.50786 | +0.08264 | 0.73084 | 236 54 35 | +85.18 | +130.75 | −2.40 |

Note.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

## JUPITER.

| 1876. | | Julian Day. | $x.$ | $y.$ | $z.$ | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x.$ | $-\frac{\kappa^2}{r^3}y.$ | $-\frac{\kappa^2}{r^3}z.$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 240 | | | | | | | | |
| May | 25 | 6400 | -2.87400 | -4.54510 | +0.08137 | 0.73063 | 237° 41′ 10″ | +83.48 | +132.01 | -2.37 |
| June | 4 | 6410 | 2.81075 | 4.58148 | 0.08007 | 0.73042 | 238 27 48 | 81.76 | 133.26 | 2.33 |
| | 14 | 6420 | 2.74696 | 4.61698 | 0.07875 | 0.73021 | 239 14 29 | 80.02 | 134.49 | 2.30 |
| | 24 | 6430 | 2.68265 | 4.65160 | 0.07742 | 0.73000 | 240 1 12 | 78.26 | 135.70 | 2.26 |
| July | 4 | 6440 | 2.61779 | 4.68533 | 0.07607 | 0.72978 | 240 47 58 | 76.48 | 136.89 | 2.23 |
| | 14 | 6450 | 2.55250 | 4.71816 | 0.07472 | 0.72956 | 241 34 47 | 74.68 | 138.06 | 2.19 |
| | 24 | 6460 | 2.48669 | 4.75009 | 0.07336 | 0.72934 | 242 21 38 | 72.87 | 139.21 | 2.15 |
| Aug. | 3 | 6470 | 2.42040 | 4.78110 | 0.07198 | 0.72911 | 243 8 32 | 71.04 | 140.34 | 2.12 |
| | 13 | 6480 | 2.35365 | 4.81119 | 0.07058 | 0.72888 | 243 55 29 | 69.19 | 141.44 | 2.08 |
| | 23 | 6490 | 2.28645 | 4.84034 | 0.06917 | 0.72865 | 244 42 29 | 67.32 | 142.52 | 2.04 |
| Sept. | 2 | 6500 | 2.21881 | 4.86857 | 0.06774 | 0.72842 | 245 29 32 | 65.44 | 143.59 | 2.00 |
| | 12 | 6510 | 2.15075 | 4.89585 | 0.06630 | 0.72818 | 246 16 38 | 63.54 | 144.63 | 1.96 |
| | 22 | 6520 | 2.08227 | 4.92219 | 0.06485 | 0.72794 | 247 3 47 | 61.62 | 145.65 | 1.92 |
| Oct. | 2 | 6530 | 2.01338 | 4.94757 | 0.06338 | 0.72770 | 247 50 59 | 59.68 | 146.65 | 1.88 |
| | 12 | 6540 | 1.94411 | 4.97198 | 0.06190 | 0.72745 | 248 38 14 | 57.72 | 147.62 | 1.84 |
| | 22 | 6550 | 1.87445 | 4.99544 | 0.06041 | 0.72721 | 249 25 33 | 55.75 | 148.57 | 1.80 |
| Nov. | 1 | 6560 | 1.80442 | 5.01791 | 0.05890 | 0.72696 | 250 12 54 | 53.76 | 149.49 | 1.75 |
| | 11 | 6570 | 1.73404 | 5.03940 | 0.05739 | 0.72670 | 251 0 20 | 51.75 | 150.39 | 1.71 |
| | 21 | 6580 | 1.66331 | 5.05991 | 0.05587 | 0.72645 | 251 47 49 | 49.73 | 151.27 | 1.67 |
| Dec. | 1 | 6590 | 1.59225 | 5.07943 | 0.05434 | 0.72619 | 252 35 21 | 47.69 | 152.13 | 1.63 |
| | 11 | 6600 | 1.52088 | 5.09795 | 0.05279 | 0.72593 | 253 22 57 | 45.63 | 152.96 | 1.59 |
| | 21 | 6610 | 1.44921 | 5.11547 | 0.05123 | 0.72567 | 254 10 37 | 43.56 | 153.77 | 1.54 |
| | 31 | 6620 | -1.37726 | -5.13199 | +0.04966 | 0.72541 | 254 58 19 | +41.47 | +154.55 | -1.50 |

## SATURN.

| 1876. | | Julian Day. | $x.$ | $y.$ | $z.$ | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x.$ | $-\frac{\kappa^2}{r^3}y.$ | $-\frac{\kappa^2}{r^3}z.$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 240 | | | | | | | | |
| | | 6250 | +8.21954 | -5.35972 | -0.24042 | 0.99192 | 326° 55′ 5″ | -11.75 | +7.66 | +0.34 |
| Jan. | 6 | 6260 | 8.24687 | 5.31297 | 0.24230 | 0.99181 | 327 14 3 | 11.80 | 7.60 | 0.34 |
| | 16 | 6270 | 8.27394 | 5.26606 | 0.24416 | 0.99170 | 327 33 1 | 11.85 | 7.54 | 0.35 |
| | 26 | 6280 | 8.30076 | 5.21898 | 0.24601 | 0.99159 | 327 51 59 | 11.89 | 7.48 | 0.35 |
| Feb. | 5 | 6290 | 8.32732 | 5.17174 | 0.24786 | 0.99148 | 328 10 58 | 11.94 | 7.42 | 0.36 |
| | 15 | 6300 | 8.35362 | 5.12434 | 0.24970 | 0.99137 | 328 29 58 | 11.98 | 7.36 | 0.36 |
| | 25 | 6310 | 8.37965 | 5.07678 | 0.25154 | 0.99126 | 328 48 59 | 12.03 | 7.29 | 0.36 |
| March | 6 | 6320 | 8.40542 | 5.02905 | 0.25337 | 0.99115 | 329 8 0 | 12.08 | 7.23 | 0.36 |
| | 16 | 6330 | 8.43093 | 4.98116 | 0.25519 | 0.99104 | 329 27 2 | 12.13 | 7.16 | 0.37 |
| | 26 | 6340 | 8.45617 | 4.93311 | 0.25700 | 0.99093 | 329 46 4 | 12.17 | 7.10 | 0.37 |
| April | 5 | 6350 | 8.48115 | 4.88491 | 0.25881 | 0.99082 | 330 5 7 | 12.22 | 7.04 | 0.37 |
| | 15 | 6360 | 8.50586 | 4.83655 | 0.26061 | 0.99070 | 330 24 11 | 12.26 | 6.98 | 0.37 |
| | 25 | 6370 | 8.53030 | 4.78804 | 0.26240 | 0.99059 | 330 43 15 | 12.31 | 6.91 | 0.38 |
| May | 5 | 6380 | 8.55447 | 4.73937 | 0.26418 | 0.99048 | 331 2 20 | 12.35 | 6.85 | 0.38 |
| | 15 | 6390 | 8.57837 | 4.69056 | 0.26595 | 0.99037 | 331 21 25 | 12.40 | 6.78 | 0.38 |
| | 25 | 6400 | 8.60200 | 4.64160 | 0.26771 | 0.99026 | 331 40 31 | 12.44 | 6.72 | 0.39 |
| June | 4 | 6410 | 8.62535 | 4.59249 | 0.26947 | 0.99014 | 331 59 38 | 12.49 | 6.65 | 0.39 |
| | 14 | 6420 | 8.64843 | 4.54324 | 0.27122 | 0.99002 | 332 18 45 | 12.53 | 6.58 | 0.39 |
| | 24 | 6430 | 8.67124 | 4.49384 | 0.27296 | 0.98991 | 332 37 53 | 12.57 | 6.51 | 0.40 |
| July | 4 | 6440 | 8.69377 | 4.44430 | 0.27469 | 0.98979 | 332 57 1 | 12.62 | 6.45 | 0.40 |
| | 14 | 6450 | 8.71603 | 4.39461 | 0.27641 | 0.98968 | 333 16 10 | 12.66 | 6.38 | 0.40 |
| | 24 | 6460 | +8.73802 | -4.34478 | -0.27812 | 0.98956 | 333 35 20 | -12.70 | +6.32 | +0.40 |

Note.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

## SATURN.

| 1876. | Julian Day. | $x$. | $y$. | $z$. | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x$. | $-\frac{\kappa^2}{r^3}y$. | $-\frac{\kappa^2}{r^3}z$. |
|---|---|---|---|---|---|---|---|---|---|
| Aug. 3 | 240<br>6470 | +8.75972 | −4.29481 | −0.27982 | 0.98945 | 333° 54′ 30″ | −12.74 | +6.25 | +0.41 |
| 13 | 6480 | 8.78114 | 4.24470 | 0.28151 | 0.98933 | 334 13 41 | 12.78 | 6.18 | 0.41 |
| 23 | 6490 | 8.80228 | 4.19445 | 0.28320 | 0.98921 | 334 32 53 | 12.82 | 6.11 | 0.41 |
| Sept. 2 | 6500 | 8.82314 | 4.14407 | 0.28488 | 0.98910 | 334 52 6 | 12.86 | 6.04 | 0.41 |
| 12 | 6510 | 8.84371 | 4.09356 | 0.28654 | 0.98898 | 335 11 19 | 12.90 | 5.97 | 0.42 |
| 22 | 6520 | 8.86400 | 4.04292 | 0.28819 | 0.98886 | 335 30 33 | 12.94 | 5.90 | 0.42 |
| Oct. 2 | 6530 | 8.88400 | 3.99214 | 0.28984 | 0.98874 | 335 49 47 | 12.98 | 5.83 | 0.42 |
| 12 | 6540 | 8.90372 | 3.94124 | 0.29148 | 0.98862 | 336 9 2 | 13.02 | 5.77 | 0.42 |
| 22 | 6550 | 8.92316 | 3.89021 | 0.29311 | 0.98850 | 336 28 17 | 13.06 | 5.70 | 0.43 |
| Nov. 1 | 6560 | 8.94231 | 3.83905 | 0.29473 | 0.98838 | 336 47 33 | 13.10 | 5.63 | 0.43 |
| 11 | 6570 | 8.96118 | 3.78777 | 0.29634 | 0.98826 | 337 6 50 | 13.14 | 5.55 | 0.43 |
| 21 | 6580 | 8.97976 | 3.73637 | 0.29795 | 0.98814 | 337 26 8 | 13.18 | 5.48 | 0.44 |
| Dec. 1 | 6590 | 8.99804 | 3.68484 | 0.29954 | 0.98802 | 337 45 26 | 13.21 | 5.41 | 0.44 |
| 11 | 6600 | 9.01603 | 3.63320 | 0.30112 | 0.98790 | 338 4 45 | 13.25 | 5.34 | 0.44 |
| 21 | 6610 | 9.03373 | 3.58144 | 0.30269 | 0.98778 | 338 24 4 | 13.29 | 5.27 | 0.45 |
| 31 | 6620 | +9.05115 | −3.52956 | −0.30425 | 0.98765 | 338 43 24 | −13.33 | +5.20 | +0.45 |

## URANUS.

| 1876. | Julian Day. | $x$. | $y$. | $z$. | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x$. | $-\frac{\kappa^2}{r^3}y$. | $-\frac{\kappa^2}{r^3}z$. |
|---|---|---|---|---|---|---|---|---|---|
|  | 240<br>6240 | −13.50983 | +12.49597 | +0.22281 | 1.26488 | 137° 14′ 5″ | +0.41 | −0.38 | −0.01 |
| Jan. 26 | 6280 | 13.61742 | 12.37257 | 0.22372 | 1.26479 | 137 44 39 | 0.42 | 0.38 | 0.01 |
| Mar. 6 | 6320 | 13.72396 | 12.24824 | 0.22462 | 1.26469 | 138 15 14 | 0.42 | 0.37 | 0.01 |
| Apr. 15 | 6360 | 13.82945 | 12.12297 | 0.22550 | 1.26460 | 138 45 50 | 0.42 | 0.37 | 0.01 |
| May 25 | 6400 | 13.93387 | 12.99679 | 0.22636 | 1.26451 | 139 16 27 | 0.43 | 0.37 | 0.01 |
| July 4 | 6440 | 14.03721 | 12.86970 | 0.22720 | 1.26442 | 139 47 4 | 0.43 | 0.36 | 0.01 |
| Aug. 13 | 6480 | 14.13947 | 12.74170 | 0.22802 | 1.26433 | 140 17 42 | 0.44 | 0.36 | 0.01 |
| Sept. 22 | 6520 | 14.24066 | 12.61283 | 0.22883 | 1.26424 | 140 48 20 | 0.44 | 0.36 | 0.01 |
| Nov. 1 | 6560 | 14.34076 | 12.48310 | 0.22962 | 1.26415 | 141 18 59 | 0.44 | 0.35 | 0.01 |
| Dec. 11 | 6600 | −14.43973 | +12.35251 | +0.23038 | 1.26406 | 141 49 38 | +0.45 | −0.35 | −0.01 |

## NEPTUNE.

| 1876. | Julian Day. | $x$. | $y$. | $z$. | Log Radius Vector. | Longitude in Orbit. | $-\frac{\kappa^2}{r^3}x$. | $-\frac{\kappa^2}{r^3}y$. | $-\frac{\kappa^2}{r^3}z$. |
|---|---|---|---|---|---|---|---|---|---|
|  | 240<br>6240 | +25.2943 | +15.7586 | −0.9171 | 1.47444 | 31° 55′.6 | −0.24 | −0.15 | +0.01 |
| Jan. 26 | 6280 | 25.2272 | 15.8657 | 0.9177 | 1.47444 | 32 10.2 | 0.24 | 0.15 | 0.01 |
| Mar. 6 | 6320 | 25.1596 | 15.9725 | 0.9183 | 1.47444 | 32 24.8 | 0.24 | 0.15 | 0.01 |
| Apr. 15 | 6360 | 25.0916 | 16.0790 | 0.9188 | 1.47444 | 32 39.4 | 0.24 | 0.15 | 0.01 |
| May 25 | 6400 | 25.0231 | 16.1852 | 0.9193 | 1.47444 | 32 53.9 | 0.24 | 0.15 | 0.01 |
| July 4 | 6440 | 24.9542 | 16.2912 | 0.9198 | 1.47444 | 33 8.5 | 0.24 | 0.15 | 0.01 |
| Aug. 13 | 6480 | 24.8848 | 16.3969 | 0.9203 | 1.47444 | 33 23.1 | 0.24 | 0.16 | 0.01 |
| Sept. 22 | 6520 | 24.8150 | 16.5023 | 0.9208 | 1.47444 | 33 37.7 | 0.24 | 0.16 | 0.01 |
| Nov. 1 | 6560 | 24.7448 | 16.6074 | 0.9212 | 1.47444 | 33 52.2 | 0.23 | 0.16 | 0.01 |
| Dec. 11 | 6600 | +24.6741 | +16.7123 | −0.9217 | 1.47444 | 34 6.8 | −0.23 | −0.16 | +0.01 |

NOTE.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.

## INCLINATIONS AND NODES.

| Planet. | Inclination. | Increase in 100 Days. | | Longitude of Ascending Node. | Increase in 100 Days. | |
|---|---|---|---|---|---|---|
| | $i$ | $\Delta i$ | $\Delta' i$ | $\Omega$ | $\Delta \Omega$ | $\Delta' \Omega$ |
| Mercury . . | 7° 0′ 9″.8 | +0″.01947 | −0″.05777 | 46° 49′ 3″.1 | +11″.644 | −1″.271 |
| Venus . . . | 3 23 35.9 | +0.01514 | −0.00772 | 75 32 6.8 | 8.904 | −2.705 |
| Mars . . . | 1 51 1.8 | −0.00586 | −0.07991 | 48 34 1.9 | 7.585 | −2.905 |
| Jupiter . . | 1 18 35.4 | −0.06189 | −0.02747 | 99 7 15.4 | 9.397 | +1.075 |
| Saturn . . . | 2 29 19.9 | −0.03825 | +0.02400 | 112 30 53.2 | 8.398 | −2.760 |
| Uranus . . | 0 46 21.1 | +0.00688 | −0.01613 | 73 21 7.0 | 5.080 | +0.885 |
| Neptune . . | 1 46 54.7 | −0.09020 | +0.00364 | 130 22 29.7 | +10.885 | −0.031 |

**Note.—The Epoch is the 2405,000th day of the Julian Period = 1872, July 25.**

**$\Delta i$ and $\Delta \Omega$ refer to the moving ecliptic and equinox.**
**$\Delta' i$ and $\Delta' \Omega$ refer to the ecliptic and equinox of the epoch.**

## MASSES. Sun's=1.

| Planet. | Mass. | Log. of Mass. | Authority. |
|---|---|---|---|
| Mercury . . | $\frac{1}{4865751}$ =.000 000 206 | 93.31285 | Encke, *A. N.*, No. 443. |
| Venus . . . | $\frac{1}{390000}$ =.000 002 564 | 94.40893 | Le Verrier, *Théor. de Merc.*, p. 115. |
| The Earth . | $\frac{1}{354936}$ =.000 002 817 | 94.44985 | Le Verrier, *Théor. de Merc.*, p. 26. |
| Mars . . . | $\frac{1}{2680637}$ =.000 000 373 | 93.57176 | Burckhardt, *Conn. des Temps.*, 1816, p. 343. |
| Jupiter . . | $\frac{1}{1047.879 \pm .235}$ =.000 954 308 | 96.979689 | Bessel, *Die Masse des Jupiter*, p. 64. |
| Saturn . . . | $\frac{1}{3501.6}$ =.000 285 584 | 96.455733 | Bessel, *Comptes Rendus*, 1841. |
| Uranus . . | $\frac{1}{24905}$ =.000 040 153 | 95.60371 | Lamont, *Mem. Ast. Soc.*, Vol. XI. p. 54. |
| Neptune . . | $\frac{1}{18780}$ =.000 053 248 | 95.72630 | Peirce, *Am. Ac. Proc.*, Vol. I. p. 333. |

## ECLIPSES IN 1876.

In the year 1876 there will be four Eclipses, two of the Sun and two of the Moon.

I. A Partial Eclipse of the Moon, March 9, 1876, visible at Washington, with the following elements:

Washington mean time of ☍ in Right Ascension, March $9^{d}\ 12^{h}\ 22^{m}\ 12^{s}.6$.

| | | | |
|---|---|---|---|
| Sun's Right Ascension | $23^{h}\ 23^{m}\ 20^{s}.06$ | Hourly Motion | $9^{s}.19$ |
| Moon's Right Ascension | 11 23 20.06 | " " | 120.80 |
| Sun's Declination | $-3^{\circ}\ 56'\ 49''.6$ | Hourly Motion | $+0'\ 58''.8$ |
| Moon's Declination | +4 53 20.0 | " " | −16 13.5 |
| Sun's Equa. Hor. Par. | 8.9 | True Semidiameter | 16 5.8 |
| Moon's Equa. Hor. Par. | 58 0.2 | " " | 15 47.7 |

From these elements may be deduced the following results:—

| | d h m | |
|---|---|---|
| Moon enters Penumbra March | 9 10 49.3 | Washington mean time. |
| Moon enters Shadow | 9 12 13.1 | " " |
| Middle of Eclipse | 9 13 13.3 | " " |
| Moon leaves Shadow | 9 14 13.4 | " " |
| Moon leaves Penumbra | 9 15 37.3 | " " |

First contact of Shadow with Moon's limb 176° from north point towards the East, when the Moon is in the zenith, in longitude 0° 45′ West from Washington, and in latitude 4° 56′ North.

Last contact of Shadow with Moon's limb 118° from north point towards the West, when the Moon is in the zenith, in longitude 29° 54′ West from Washington, and in latitude 4° 24′ North.

Magnitude of the Eclipse = 0.298 (Moon's diameter = 1).

II. An Annular Eclipse of the Sun, March 25, 1876, visible at Washington, with the following elements:

Washington mean time of ☌ in Right Ascension, March $25^{d}\ 3^{h}\ 34^{m}\ 1^{s}.5$.

| | | | |
|---|---|---|---|
| Sun and Moon's R. A. | $0^{h}\ 20^{m}\ 23^{s}.70$ | Hourly Motions | $9^{s}.09$ and $120^{s}.44$ |
| Sun's Declination | $+2^{\circ}\ 12'\ 31''.2$ | Hourly Motion | $+0'\ 58''.8$ |
| Moon's Declination | +2 53 9.8 | " " | +16 23.7 |
| Sun's Equa. Hor. Par. | 8.9 | True Semidiameter | 16 1.5 |
| Moon's Equa Hor. Por. | 58 4.1 | " " | 15 48.6 |

From these elements may be deduced the following results:—

Eclipse begins on the Earth March $25^{d}\ 0^{h}\ 21^{m}.2$, Washington mean time, in longitude 93° 37′.1 West from Washington, and in latitude 5° 39′.5 South.

Central Eclipse begins on the Earth $1^{h}\ 30^{m}.4$, in longitude 111° 28′.8 West from Washington, and in latitude 8° 41′.8 North.

Central Eclipse at Noon $3^{h}\ 34^{m}.0$, in longitude 51° 43′.1 West from Washington, and in latitude 48° 3′.1 North.

Central Eclipse ends on the Earth $4^{h}\ 22^{m}.8$, in longitude 30° 58′.4 East from Washington, and in latitude 67° 0′.4 North.

Eclipse ends on the Earth $5^{h}\ 32^{m}.2$, in longitude 11° 19′.8 East from Washington, and in latitude 52° 28′.2 North.

## DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

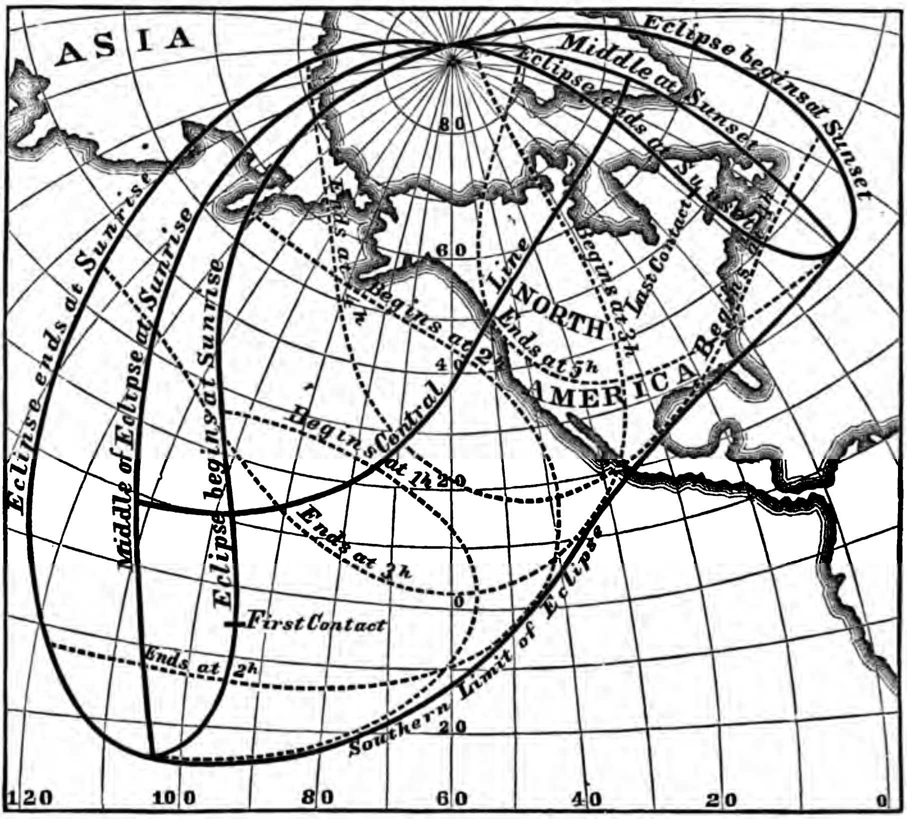
| Wash. M. Time. | A. | B. | C. | log E. | log F. | log G. | log H. | μ |
|---|---|---|---|---|---|---|---|---|
| h m | | | | 9.99 | 9.99 | +8.5 | +8.6 | ° ′ ″ |
| 0 20 | −1.55179 | +0.39175 | −0.70823 | 9769 | 9616 | 1775 | 2640 | 3 31 51.5 |
| 0 30 | 1.47184 | 0.43608 | 0.66387 | 9768 | 9615 | 1835 | 2687 | 6 1 54.1 |
| 0 40 | 1.39189 | 0.48041 | 0.61952 | 9768 | 9614 | 1895 | 2734 | 8 31 56.8 |
| 0 50 | 1.31194 | 0.52473 | 0.57516 | 9767 | 9613 | 1955 | 2781 | 11 1 59.4 |
| 1 0 | 1.23198 | 0.56905 | 0.53081 | 9766 | 9612 | 2014 | 2827 | 13 32 2.0 |
| 1 10 | 1.15202 | 0.61337 | 0.48646 | 9766 | 9611 | 2074 | 2874 | 16 2 4.6 |
| 1 20 | 1.07206 | 0.65768 | 0.44211 | 9765 | 9611 | 2133 | 2920 | 18 32 7.3 |
| 1 30 | 0.99209 | 0.70199 | 0.39777 | 9764 | 9610 | 2193 | 2966 | 21 2 9.9 |
| 1 40 | 0.91212 | 0.74630 | 0.35342 | 9764 | 9609 | 2253 | 3013 | 23 32 12.5 |
| 1 50 | 0.83214 | 0.79061 | 0.30908 | 9763 | 9608 | 2312 | 3059 | 26 2 15.1 |
| 2 0 | 0.75215 | 0.83491 | 0.26474 | 9762 | 9607 | 2372 | 3105 | 28 32 17.8 |
| 2 10 | 0.67217 | 0.87921 | 0.22040 | 9762 | 9606 | 2431 | 3152 | 31 2 20.4 |
| 2 20 | 0.59218 | 0.92351 | 0.17606 | 9761 | 9606 | 2491 | 3198 | 33 32 23.0 |
| 2 30 | 0.51219 | 0.96781 | 0.13173 | 9760 | 9605 | 2550 | 3244 | 36 2 25.6 |
| 2 40 | 0.43220 | 1.01210 | 0.08740 | 9760 | 9604 | 2609 | 3290 | 38 32 28.3 |
| 2 50 | 0.35221 | 1.05640 | −0.04306 | 9759 | 9603 | 2668 | 3336 | 41 2 30.9 |
| 3 0 | 0.27221 | 1.10069 | +0.00127 | 9758 | 9602 | 2727 | 3382 | 43 32 33.5 |
| 3 10 | 0.19221 | 1.14498 | 0.04560 | 9758 | 9601 | 2786 | 3428 | 46 2 36.1 |
| 3 20 | 0.11221 | 1.18927 | 0.08993 | 9757 | 9600 | 2844 | 3474 | 48 32 38.8 |
| 3 30 | −0.03221 | 1.23355 | 0.13425 | 9756 | 9600 | 2903 | 3520 | 51 2 41.4 |
| 3 40 | +0.04779 | 1.27783 | 0.17857 | 9756 | 9599 | 2961 | 3566 | 53 32 44.0 |
| 3 50 | 0.12780 | 1.32210 | 0.22289 | 9755 | 9598 | 3020 | 3612 | 56 2 46.6 |
| 4 0 | 0.20781 | 1.36637 | 0.26721 | 9754 | 9597 | 3078 | 3658 | 58 32 49.3 |
| 4 10 | 0.28781 | 1.41064 | 0.31153 | 9754 | 9596 | 3136 | 3704 | 61 2 51.9 |
| 4 20 | 0.36782 | 1.45491 | 0.35585 | 9753 | 9595 | 3195 | 3749 | 63 32 54.5 |
| 4 30 | 0.44783 | 1.49917 | 0.40017 | 9752 | 9594 | 3253 | 3795 | 66 2 57.1 |
| 4 40 | 0.52784 | 1.54343 | 0.44448 | 9752 | 9593 | 3311 | 3840 | 68 32 59.8 |
| 4 50 | 0.60785 | 1.58769 | 0.48880 | 9751 | 9593 | 3369 | 3886 | 71 3 2.4 |
| 5 0 | 0.68786 | 1.63195 | 0.53311 | 9750 | 9592 | 3427 | 3931 | 73 33 5.0 |
| 5 10 | 0.76787 | 1.67621 | 0.57742 | 9749 | 9591 | 3485 | 3976 | 76 3 7.6 |
| 5 20 | 0.84788 | 1.72046 | 0.62173 | 9749 | 9590 | 3542 | 4022 | 78 33 10.3 |
| 5 30 | 0.92789 | 1.76471 | 0.66604 | 9748 | 9589 | 3600 | 4067 | 81 3 12.9 |
| 5 40 | +1.00790 | +1.80896 | +0.71035 | 9747 | 9588 | 3657 | 4113 | 83 33 16.5 |

## FOR SHADOW.

| Washington Mean Time. | A. | B. | Washington Mean Time. | A. | B. |
|---|---|---|---|---|---|
| h m | | | h m | | |
| 1 30 | +0.15605 | +0.14817 | 3 0 | +0.55475 | +0.54721 |
| 1 40 | 0.20036 | 0.19251 | 3 10 | 0.59904 | 0.59154 |
| 1 50 | 0.24467 | 0.23685 | 3 20 | 0.64332 | 0.63587 |
| 2 0 | 0.28897 | 0.28119 | 3 30 | 0.68760 | 0.68019 |
| 2 10 | 0.33327 | 0.32553 | 3 40 | 0.73188 | 0.72452 |
| 2 20 | 0.37757 | 0.36987 | 3 50 | 0.77615 | 0.76884 |
| 2 30 | 0.42187 | 0.41421 | 4 0 | 0.82042 | 0.81316 |
| 2 40 | 0.46617 | 0.45854 | 4 10 | 0.86469 | 0.85748 |
| 2 50 | 0.51046 | 0.50288 | 4 20 | 0.90895 | 0.90180 |
| 3 0 | +0.55475 | +0.54721 | 4 30 | +0.95322 | +0.94611 |

A, μ, log E, and log F are the same as for Penumbra, and the values of log G and log H may be obtained from the corresponding values for Penumbra, by numerically increasing log G and decreasing log H by 0.00027.

OUTLINES AND PATH OF THE PENUMBRA AND THE CENTRAL LINE OF THE ANNULAR ECLIPSE OF MARCH 25, 1876.



## CHANGES OF THE QUANTITIES IN THE TABLES OF DATA IN UNITS OF THE SIXTH PLACE OF DECIMALS.

| Washington Mean Time. | For one Minute. |  |  | For one Second. |  |  |
|---|---|---|---|---|---|---|
|  | A. | B. | C. | A′. | B′. | C′. |
| h m |  |  |  |  |  |  |
| 0 0 | +7993.7 | +4433.5 | +4436.2 | +133.23 | +73.89 | +73.94 |
| 0 30 | 7995.0 | 4432.7 | 4435.7 | 133.25 | 73.88 | 73.93 |
| 1 0 | 7996.2 | 4431.8 | 4435.1 | 133.27 | 73.86 | 73.92 |
| 1 30 | 7997.2 | 4431.0 | 4434.5 | 133.29 | 73.85 | 73.91 |
| 2 0 | 7998.1 | 4430.3 | 4434.0 | 133.30 | 73.84 | 73.90 |
| 2 30 | 7999.0 | 4429.7 | 4433.5 | 133.32 | 73.83 | 73.89 |
| 3 0 | 7999.7 | 4428.9 | 4432.9 | 133.33 | 73.81 | 73.88 |
| 3 30 | 8000.3 | 4428.0 | 4432.3 | 133.34 | 73.80 | 73.87 |
| 4 0 | 8000.6 | 4427.1 | 4432.0 | 133.34 | 73.78 | 73.87 |
| 4 30 | 8000.8 | 4426.3 | 4431.7 | 133.35 | 73.77 | 73.86 |
| 5 0 | 8000.9 | 4425.7 | 4431.3 | 133.35 | 73.76 | 73.85 |
| 5 30 | 8001.0 | 4425.2 | 4430.8 | 133.35 | 73.75 | 73.85 |
| 6 0 | +8000.9 | +4424.8 | +4430.3 | +133.35 | +73.75 | +73.84 |

III. A Partial Eclipse of the Moon, September 3, 1876, invisible at Washington, with the following elements:

Washington mean time of ☍ in Right Ascension, September 3 d 3 h 24 m 23.6 s.

|  |  |  |  |
|---|---|---|---|
|  | h m s |  | s |
| Sun's Right Ascension | 10 52 12.08 | Hourly Motion | 9.04 |
| Moon's Right Ascension | 22 52 12.08 | " " | 112.32 |
|  | ° ′ ″ |  | ′ ″ |
| Sun's Declination | +7 12 13.2 | Hourly Motion | − 0 55.4 |
| Moon's Declination | −8 3 47.7 | " " | +14 31.9 |
| Sun's Equa. Hor. Par. | 8.8 | True Semidiameter | 15 52.2 |
| Moon's Equa. Hor. Par. | 55 33.3 | " " | 15 7.7 |

From these elements may be deduced the following results:—

|  | d | h | m |  |
|---|---|---|---|---|
| Moon enters Penumbra September | 3 | 1 | 39.2 | Washington mean time. |
| Moon enters Shadow | 3 | 3 | 6.8 | " " |
| Middle of Eclipse | 3 | 4 | 14.3 | " " |
| Moon leaves Shadow | 3 | 5 | 21.7 | " " |
| Moon leaves Penumbra | 3 | 6 | 49.3 | " " |

First contact of Shadow with Moon's limb 8° from north point towards the East, when the Moon is in the zenith, in longitude 132° 55′ East from Washington, and in latitude 8° 8′ South.

Last contact of Shadow with Moon's limb 64° from north point towards the West, when the Moon is in the zenith, in longitude 100° 9′ East from Washington, and in latitude 7° 35′ South.

Magnitude of the Eclipse = 0.348 (Moon's diameter = 1).

IV. A Total Eclipse of the Sun, September 17, 1876, invisible at Washington, with the following elements :

Washington mean time of ☌ in Right Ascension, September $17^{d}\ 5^{h}\ 11^{m}\ 10^{s}.0$.

| | | | |
|---|---|---|---|
| Sun and Moon's R. A. | $11^{h}\ 42^{m}\ 50^{s}.06$ | Hourly Motions | $8^{s}.98$ and $123^{s}.60$ |
| Sun's Declination | $+1^{\circ}\ 51'\ 35''.4$ | Hourly Motion | $-\ 0'\ 58''.2$ |
| Moon's Declination | +1 17 37.6 | " " | −16 52.3 |
| Sun's Equa. Hor. Par. | 8.8 | True Semidiameter | 15 55.7 |
| Moon's Equa. Hor. Par. | 58 53.0 | " " | 16 1.9 |

From these elements may be deduced the following results:—

Eclipse begins on the Earth September $17^{d}\ 2^{h}\ 4^{m}.3$, Washington mean time, in longitude 122° 53′.0 West from Washington, and in latitude 9° 58′.9 North.

Central Eclipse begins on the Earth $3^{h}\ 8^{m}.2$, in longitude 138° 28′.3 West from Washington, and in latitude 1° 18′.6 South.

Central Eclipse at Noon $5^{h}\ 11^{m}.2$, in longitude 79° 16′.1 West from Washington, and in latitude 33° 41′.1 South.

Central Eclipse ends on the Earth $6^{h}\ 13^{m}.7$, in longitude 8° 2′.8 West from Washington, and in latitude 59° 27′.7 South.

Eclipse ends on the Earth $7^{h}\ 17^{m}.7$, in longitude 22° 57′.8 West from Washington, and in latitude 48° 20′.4 South.

### DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

| Wash. M. Time. | A. | B. | C. | log E. | log F. | log G. | log H. | μ |
|---|---|---|---|---|---|---|---|---|
| h m | | | | 9.99 | 9.99 | +8.4 | +8.5 | ° ′ ″ |
| 2 0 | −1.55402 | +0.82705 | −0.25657 | 9826 | 9691 | 5768 | 7973 | 31 27 39.7 |
| 2 10 | 1.47275 | 0.78198 | 0.30184 | 9827 | 9692 | 5700 | 7922 | 33 57 42.5 |
| 2 20 | 1.39147 | 0.73691 | 0.34711 | 9827 | 9692 | 5632 | 7870 | 36 27 45.4 |
| 2 30 | 1.31019 | 0.69184 | 0.39237 | 9828 | 9693 | 5563 | 7818 | 38 57 48.3 |
| 2 40 | 1.22891 | 0.64677 | 0.43763 | 9828 | 9694 | 5494 | 7766 | 41 27 51.2 |
| 2 50 | 1.14763 | 0.60169 | 0.48289 | 9829 | 9695 | 5425 | 7714 | 43 57 54.2 |
| 3 0 | 1.06635 | 0.55661 | 0.52815 | 9829 | 9696 | 5356 | 7662 | 46 27 57.2 |
| 3 10 | 0.98507 | 0.51152 | 0.57341 | 9830 | 9696 | 5287 | 7610 | 48 58 0.1 |
| 3 20 | 0.90378 | 0.46643 | 0.61866 | 9831 | 9698 | 5218 | 7558 | 51 28 3.0 |
| 3 30 | 0.82249 | 0.42133 | 0.66391 | 9831 | 9698 | 5149 | 7506 | 53 58 6.0 |
| 3 40 | 0.74120 | 0.37623 | 0.70916 | 9832 | 9698 | 5080 | 7454 | 56 28 8.9 |
| 3 50 | 0.65990 | 0.33113 | 0.75440 | 9832 | 9699 | 5010 | 7402 | 58 58 11.8 |
| 4 0 | 0.57859 | 0.28602 | 0.79964 | 9833 | 9700 | 4940 | 7349 | 61 28 14.7 |
| 4 10 | 0.49728 | 0.24092 | 0.84487 | 9833 | 9701 | 4871 | 7297 | 63 58 17.6 |
| 4 20 | 0.41598 | 0.19581 | 0.89011 | 9834 | 9702 | 4801 | 7245 | 66 28 20.5 |
| 4 30 | 0.33468 | 0.15071 | 0.93534 | 9834 | 9702 | 4731 | 7192 | 68 58 23.4 |
| 4 40 | 0.25338 | 0.10560 | 0.98057 | 9835 | 9703 | 4661 | 7140 | 71 28 26.4 |
| 4 50 | 0.17208 | 0.06049 | 1.02580 | 9836 | 9704 | 4591 | 7087 | 73 58 29.3 |
| 5 0 | 0.09079 | +0.01538 | 1.07102 | 9836 | 9705 | 4521 | 7035 | 76 28 32.2 |
| 5 10 | −0.00949 | −0.02973 | 1.11624 | 9837 | 9705 | 4451 | 6982 | 78 58 35.1 |
| 5 20 | +0.07181 | 0.07484 | 1.16145 | 9837 | 9706 | 4380 | 6930 | 81 28 38.0 |
| 5 30 | 0.15310 | 0.11995 | 1.20666 | 9838 | 9707 | 4309 | 6877 | 83 58 40.9 |
| 5 40 | 0.23439 | 0.16506 | 1.25187 | 9838 | 9707 | 4238 | 6824 | 86 28 43.8 |
| 5 50 | 0.31568 | 0.21017 | 1.29707 | 9839 | 9708 | 4167 | 6772 | 88 58 46.7 |
| 6 0 | 0.39697 | 0.25527 | 1.34227 | 9839 | 9709 | 4097 | 6719 | 91 28 49.6 |
| 6 10 | 0.47826 | 0.30038 | 1.38746 | 9840 | 9710 | 4026 | 6666 | 93 58 52.6 |
| 6 20 | 0.55954 | 0.34548 | 1.43265 | 9840 | 9710 | 3955 | 6613 | 96 28 55.5 |
| 6 30 | +0.64082 | −0.39058 | −1.47783 | 9841 | 9711 | 3884 | 6560 | 98 58 58.4 |

## DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

| Wash. M. Time. | A. | B. | C. | log E. | log F. | log G. | log H. | μ |
|---|---|---|---|---|---|---|---|---|
| h m |  |  |  | 99.9 | 9.99 | + 8.4 | + 8.5 | ° ′ ″ |
| 6 40 | +0.72210 | −0.43568 | −1.52301 | 9842 | 9712 | 3813 | 6507 | 101 29 1.3 |
| 6 50 | 0.80338 | 0.48078 | 1.56819 | 9842 | 9712 | 3741 | 6454 | 103 59 4.2 |
| 7 0 | 0.88465 | 0.52588 | 1.61336 | 9843 | 9713 | 3669 | 6400 | 106 29 7.1 |
| 7 10 | 0.96591 | 0.57098 | 1.65853 | 9843 | 9714 | 3598 | 6347 | 108 59 10.0 |
| 7 20 | +1.04716 | −0.61608 | −1.70369 | 9844 | 9714 | 3526 | 6293 | 111 29 13.0 |

## FOR SHADOW.

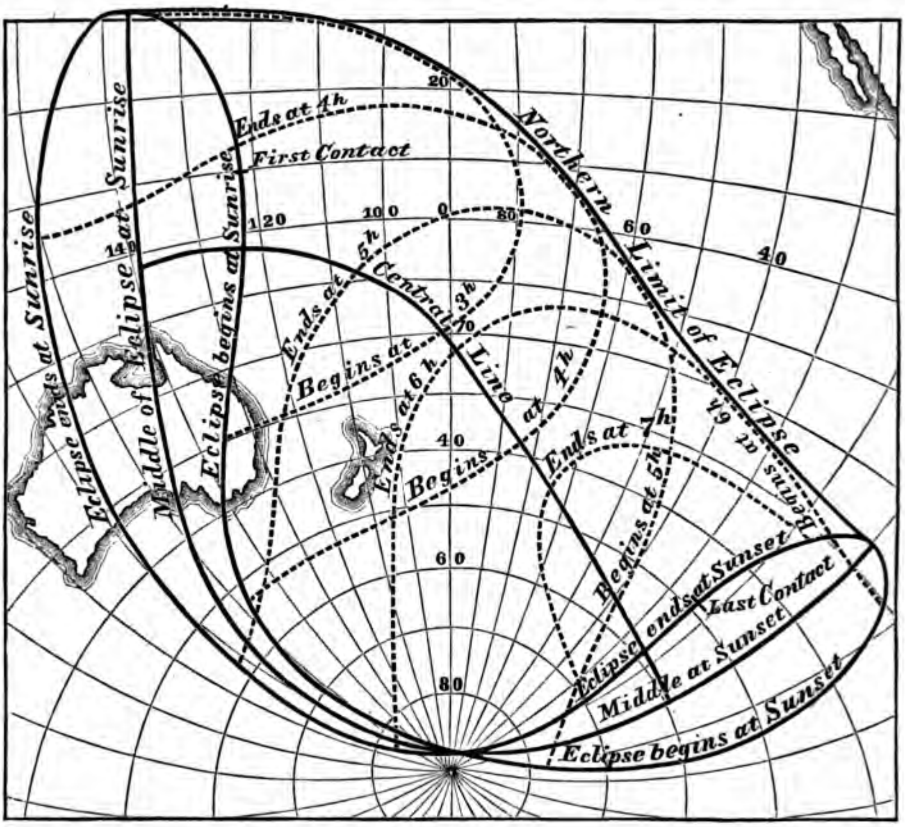
| Washington Mean Time. | B. | C. | Washington Mean Time. | B. | C. |
|---|---|---|---|---|---|
| h m |  |  | h m |  |  |
| 3 0 | +0.01218 | +0.01638 | 4 40 | −0.43932 | −0.43567 |
| 3 10 | −0.03297 | −0.02884 | 4 50 | 0.48447 | 0.48085 |
| 3 20 | 0.07812 | 0.07406 | 5 0 | 0.52961 | 0.52603 |
| 3 30 | 0.12327 | 0.11927 | 5 10 | 0.57476 | 0.57121 |
| 3 40 | 0.16842 | 0.16448 | 5 20 | 0.61990 | 0.61639 |
| 3 50 | 0.21357 | 0.20969 | 5 30 | 0.66504 | 0.66157 |
| 4 0 | 0.25872 | 0.25490 | 5 40 | 0.71018 | 0.70674 |
| 4 10 | 0.30387 | 0.30010 | 5 50 | 0.75532 | 0.75191 |
| 4 20 | 0.34902 | 0.34529 | 6 0 | 0.80046 | 0.79708 |
| 4 30 | 0.39417 | 0.39048 | 6 10 | 0.84559 | 0.84224 |
| 4 40 | −0.43932 | −0.43567 | 6 20 | −0.89072 | −0.88740 |

A, μ, log E, and log F are the same as for Penumbra, and the values of log G and log H may be obtained from the corresponding values for Penumbra, by numerically increasing log G by **0.00037**, and by numerically decreasing log H by **0.00027.**

## CHANGES OF THE QUANTITIES IN THE TABLES OF DATA IN UNITS OF THE SIXTH PLACE OF DECIMALS.

| Washington Mean Time. | For one Minute. |  |  | For one Second. |  |  |
|---|---|---|---|---|---|---|
|  | A. | B. | C. | A′. | B′. | C′. |
| h m |  |  |  |  |  |  |
| 2 0 | +8126.7 | −4505.5 | −4526.8 | +135.44 | −75.09 | −75.45 |
| 2 30 | 8127.8 | 4507.3 | 4526.3 | 135.46 | 75.12 | 75.44 |
| 3 0 | 8128.7 | 4508.7 | 4525.6 | 135.48 | 75.14 | 75.43 |
| 3 30 | 8129.3 | 4509.8 | 4524.8 | 135.49 | 75.16 | 75.41 |
| 4 0 | 8129.7 | 4510.4 | 4523.9 | 135.49 | 75.17 | 75.40 |
| 4 30 | 8130.0 | 4510.7 | 4523.0 | 135.50 | 75.18 | 75.38 |
| 5 0 | 8129.8 | 4510.9 | 4521.9 | 135.50 | 75.18 | 75.36 |
| 5 30 | 8129.3 | 4510.8 | 4520.8 | 135.49 | 75.18 | 75.35 |
| 6 0 | 8128.7 | 4510.6 | 4519.5 | 135.48 | 75.18 | 75.33 |
| 6 30 | 8128.0 | 4510.2 | 4518.2 | 135.47 | 75.17 | 75.30 |
| 7 0 | 8127.0 | 4510.0 | 4516.9 | 135.45 | 75.17 | 75.28 |
| 7 30 | +8124.7 | −4509.8 | −4515.5 | +135.41 | −75.16 | −75.26 |

OUTLINES AND PATH OF THE PENUMBRA AND THE CENTRAL LINE OF THE TOTAL ECLIPSE OF SEPTEMBER 17, 1876.



## OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT WASHINGTON, D. C., DURING THE YEAR 1876.

| Date. | Star's Name. | Magnitude. | IMMERSION. | | | | EMERSION. | | | | Duration of Occultation. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Washington | | Angle from | | Washington | | Angle from | | |
| | | | Sidereal Time. | Mean Time. | North Point. | Vertex. | Sidereal Time. | Mean Time. | North Point. | Vertex. | |
| | | | h m | h m | ° | ° | h m | h m | ° | ° | h m |
| Jan. 1 | 70 Aquarii | 6 | 22 40 | 3 57 | 299 | 299 | 0 0 | 5 16 | 143 | 162 | 1 20 |
| 7 | $\chi^1$ Tauri‡ | 5½ | 11 27 | 16 18 | 280 | 328 | 12 15 | 17 6 | 89 | 132 | 0 48 |
| 7 | $\chi^2$ Tauri‡ | 8½ | 11 28 | 16 19 | 281 | 329 | 12 15 | 17 6 | 88 | 131 | 0 48 |
| 8 | B. A. C. 1648 | 6½ | 8 20 | 13 8 | 306 | 7 | 9 13 | 14 1 | 50 | 111 | 0 53 |
| 9 | B. A. C. 2097 | 6½ | 8 21 | 13 4 | 305 | 4 | 9 10 | 13 53 | 34 | 96 | 0 49 |
| 9 | 49 Aurigæ | 5½ | 10 37 | 15 20 | 321 | 22 | 11 3 | 15 46 | 13 | 73 | 0 26 |
| 10 | *c* Geminorum | 4½ | 11 0 | 15 39 | 292 | 352 | 11 44 | 16 23 | 25 | 85 | 0 44 |
| 22 | $\gamma^1$ Sagittarii | 4 | 15 7 | 18 58 | 169 | 137 | Star 4′.9 | south of | ☽ 's | limb. | |
| 29 | B. A C. 8184* | 5½ | 5 16 | 8 41 | 293 | 344 | 6 10 | 9 36 | 125 | 176 | 0 54 |
| 31 | ε Piscium | 4 | 5 31 | 8 49 | 264 | 315 | 6 23 | 9 41 | 151 | 203 | 0 52 |
| Feb. 3 | 9 Tauri | 6 | 1 19 | 4 26 | 260 | 207 | 2 19 | 5 25 | 156 | 119 | 1 0 |
| 3 | *g* Pleiadum | 5½ | 6 20 | 9 25 | 327 | 24 | 7 14 | 10 19 | 61 | 119 | 0 54 |
| 3 | *b* Pleiadum | 4½ | 6 7 | 9 12 | 286 | 342 | 7 20 | 10 26 | 102 | 160 | 1 13 |
| 3 | *c* Pleiadum | 5 | 6 56 | 10 1 | 333 | 31 | 7 40 | 10 46 | 51 | 109 | 0 44 |
| 3 | *d* Pleiadum | 5 | 7 2 | 10 7 | 227 | 285 | 7 42 | 10 47 | 156 | 214 | 0 40 |
| 3 | η Tauri | 3 | 7 29 | 10 34 | 255 | 313 | 8 28 | 11 33 | 126 | 183 | 1 0 |
| 3 | *f* Pleiadum | 4½ | 8 25 | 11 31 | 222 | 280 | 8 59 | 12 4 | 156 | 212 | 0 34 |
| 3 | *h* Pleiadum | 5½ | 8 18 | 11 24 | 247 | 305 | 9 10 | 12 16 | 131 | 186 | 0 52 |
| 6 | 47 Geminor. | 6 | 11 14 | 14 7 | 241 | 301 | 12 10 | 15 3 | 84 | 141 | 0 57 |
| 7 | $\omega^2$ Cancri | 6½ | 3 33 | 6 23 | 279 | 220 | 4 37 | 7 27 | 66 | 7 | 1 4 |
| 9 | 34 Leonis | 6 | 11 2 | 13 44 | 204 | 228 | 12 7 | 14 48 | 81 | 122 | 1 5 |
| 16 | A$^2$ Scorpii | 5 | 11 28 | 13 42 | 267 | 222 | 12 33 | 14 46 | 38 | 2 | 1 4 |
| 16 | B. A. C. 5255 | 6 | 11 49 | 14 2 | 263 | 221 | 12 57 | 15 11 | 41 | 8 | 1 8 |
| 16 | 3 Scorpii | 6 | 12 25 | 14 38 | 332 | 294 | Star 2′.1 | north of | ☽ 's | limb. | |
| 16 | π Scorpii | 3 | 15 9 | 17 22 | 228 | 219 | 16 36 | 18 49 | 85 | 95 | 1 28 |
| 28 | π Piscium | 6 | 5 52 | 7 19 | 216 | 268 | 6 3 | 7 31 | 195 | 247 | 0 11 |
| Mar. 1 | 66 Arietis | 6½ | 7 26 | 8 46 | 167 | 224 | Star 2′.2 | south of | ☽ 's | limb. | |
| 1 | 9 Tauri‡ | 6 | 10 47 | 12 6 | 233 | 280 | 11 12 | 12 31 | 168 | 213 | 0 25 |
| 4 | 49 Aurigæ | 5½ | 5 29 | 6 36 | 205 | 160 | 6 7 | 7 15 | 151 | 131 | 0 38 |
| 4 | 54 Aurigæ | 6 | 7 32 | 8 39 | 287 | 333 | 8 41 | 9 48 | 51 | 111 | 1 9 |
| 5 | *c* Geminorum | 4½ | 8 2 | 9 5 | 206 | 227 | 8 58 | 10 1 | 116 | 164 | 0 56 |
| 11 | 50 Virginis | 6 | 15 19 | 15 58 | 206 | 237 | 16 26 | 17 5 | 85 | 126 | 1 7 |
| 30 | B. A. C. 1648 | 6½ | 10 25 | 9 50 | 274 | 332 | 11 21 | 10 46 | 79 | 133 | 0 56 |
| 31 | B. A. C. 2097 | 6½ | 12 35 | 11 55 | 348 | 42 | Star 1′.7 | north of | ☽ 's | limb. | |
| 31 | 49 Aurigæ* | 5½ | 14 15 | 13 36 | 350 | 34 | Star 3′.5 | north of | ☽ 's | limb. | |
| Apr. 5 | χ Leonis | 5 | 6 59 | 6 0 | 252 | 202 | 8 7 | 7 9 | 42 | 358 | 1 9 |
| 8 | α Virginis* | 1 | 6 56 | 5 45 | 290 | 238 | 7 31 | 6 21 | 9 | 318 | 0 36 |
| 8 | B. A. C. 4531 | 6 | 13 36 | 12 24 | 213 | 215 | 14 54 | 13 43 | 70 | 90 | 1 18 |
| 11 | B. A. C. 5314 | 6 | 12 54 | 11 31 | 328 | 294 | 13 1 | 11 38 | 338 | 305 | 0 7 |
| 11 | B. A. C. 5347 | 5 | 15 59 | 14 36 | 307 | 307 | 16 51 | 15 27 | 15 | 25 | 0 51 |
| 20 | 20 Piscium† | 6 | 17 34 | 15 35 | 287 | 236 | 18 32 | 16 32 | 130 | 80 | 0 58 |
| 25 | η Tauri | 3 | 8 23 | 6 6 | 245 | 303 | 9 13 | 6 56 | 133 | 188 | 0 49 |
| 25 | *f* Pleiadum | 4 | 9 17 | 7 0 | 210 | 265 | 9 38 | 7 21 | 167 | 221 | 0 21 |
| 25 | *h* Pleiadum | 5½ | 9 8 | 6 50 | 239 | 295 | 9 51 | 7 34 | 137 | 190 | 0 43 |
| 28 | 47 Geminor. | 6 | 11 21 | 8 52 | 243 | 303 | 12 19 | 9 49 | 82 | 139 | 0 58 |
| May 1 | 34 Leonis | 6 | 15 21 | 12 40 | 330 | 23 | Star 0′.8 | north of | ☽ 's | limb. | |
| 4 | B. A. C. 4200 | 6 | 11 28 | 8 35 | 143 | 128 | 11 35 | 8 42 | 133 | 120 | 0 7 |
| 4 | B. A. C. 4225 | 6½ | 13 28 | 10 35 | 240 | 258 | 14 46 | 11 53 | 41 | 74 | 1 18 |
| 4 | *f* Virginis | 6 | 17 10 | 14 16 | 269 | 317 | 18 5 | 15 11 | 34 | 85 | 0 55 |
| 12 | B. A. C. 6628 | 6 | 16 39 | 13 14 | 240 | 210 | 17 52 | 14 26 | 133 | 116 | 1 12 |

## OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT WASHINGTON, D. C., DURING THE YEAR 1876.

| Date. | Star's Name. | Magnitude. | IMMERSION. | | | | EMERSION. | | | | Duration of Occultation. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Washington | | Angle from | | Washington | | Angle from | | |
| | | | Sidereal Time. | Mean Time. | North Point. | Vertex. | Sidereal Time. | Mean Time. | North Point. | Vertex. | |
| | | | h m | h m | ° | ° | h m | h m | ° | ° | h m |
| May 14 | *χ* Capricorni | 6 | 18 29 | 14 55 | 279 | 249 | 19 55 | 16 21 | 131 | 117 | 1 26 |
| 17 | B. A. C. 8184 | 5½ | 20 44 | 16 58 | 35 | 358 | Star 5′.0 | north of | ☽'s | limb. | |
| June 1 | 50 Virginis‡ | 6 | 18 5 | 13 21 | 259 | 308 | 19 5 | 14 21 | 51 | 102 | 1 0 |
| 9 | *ω* Sagittarii | 5 | 15 37 | 10 21 | 185 | 141 | Star 2′.0 | south of | ☽'s | limb. | |
| 10 | B. A. C. 7197 | 6 | 16 36 | 11 16 | 248 | 205 | 17 39 | 12 19 | 143 | 108 | 1 3 |
| 13 | $h^3$ Aquarii* | 7 | 16 17 | 10 45 | 267 | 216 | 17 9 | 11 38 | 141 | 90 | 0 52 |
| 13 | $h^4$ Aquarii† | 7½ | 17 0 | 11 28 | 289 | 238 | 18 2 | 12 31 | 124 | 75 | 1 2 |
| 29 | B. A. C. 4531 | 6 | 13 25 | 6 51 | 301 | 300 | 13 54 | 7 21 | 17 | 23 | 0 30 |
| July 2 | B. A. C. 5347 | 5 | 17 58 | 11 12 | 348 | 12 | Star 3′.6 | north of | ☽'s | limb | |
| 15 | 47 Arietis* | 6 | 21 17 | 13 39 | 341 | 287 | 21 56 | 14 18 | 73 | 18 | 0 40 |
| 29 | *b* Scorpii | 5 | 17 43 | 9 11 | 297 | 321 | 18 49 | 10 16 | 37 | 72 | 1 5 |
| 29 | 4 Scorpii* | 6 | 20 44 | 12 11 | 206 | 254 | 21 19 | 12 46 | 142 | 194 | 0 35 |
| 30 | B. A. C. 5603 | 6½ | 18 52 | 10 16 | 201 | 227 | 19 29 | 10 52 | 151 | 184 | 0 37 |
| Aug. 2 | B. A. C. 6666 | 6 | 21 2 | 12 14 | 339 | 359 | 21 59 | 13 11 | 75 | 105 | 0 57 |
| 4 | 27 Capricorni | 6 | 19 34 | 10 38 | 293 | 274 | 21 3 | 12 7 | 127 | 127 | 1 29 |
| 6 | SATURN | | 19 39 | 10 35 | 17 | 340 | 19 58 | 10 54 | 46 | 12 | 0 19 |
| 31 | B. A. C. 7197 | 6 | 17 26 | 6 44 | 198 | 162 | Star 0′.2 | south of | ☽'s | limb. | |
| Sept. 1 | *δ* Capricorni | 3 | 1 49 | 15 2 | 7 | 51 | 2 19 | 15 32 | 60 | 107 | 0 30 |
| 2 | SATURN | | 1 31 | 14 40 | 279 | 317 | 2 31 | 15 40 | 153 | 198 | 1 0 |
| 3 | *φ* Aquarii | 4½ | 21 49 | 10 54 | 313 | 293 | 23 11 | 12 17 | 130 | 131 | 1 22 |
| 3 | 96 Aquarii | 5½ | 1 59 | 15 4 | 277 | 314 | 3 0 | 16 5 | 157 | 201 | 1 0 |
| 3 | B. A. C. 8134 | 6½ | 3 27 | 16 32 | 293 | 339 | 4 29 | 17 33 | 135 | 185 | 1 1 |
| 5 | 60 Piscium | 6 | 23 26 | 12 23 | 323 | 299 | 0 44 | 13 41 | 120 | 121 | 1 18 |
| 7 | B. A. C. 782 | 6½ | 4 21 | 17 10 | 206 | 250 | Star 0′.3 | south of | ☽'s | limb. | |
| 10 | B. A. C. 1648 | 6½ | 22 34 | 11 12 | 315 | 263 | 23 18 | 11 56 | 71 | 16 | 0 44 |
| 11 | B. A. C. 2097 | 6½ | 0 51 | 13 24 | 6 | 309 | Star 0′.9 | north of | ☽'s | limb. | |
| 11 | 49 Aurigæ | 5½ | 2 16 | 14 49 | 277 | 216 | 3 24 | 15 57 | 91 | 30 | 1 8 |
| 13 | *γ* Cancri | 4½ | 4 12 | 16 37 | 167 | 110 | Star 0′.9 | south of | ☽'s | limb. | |
| 14 | 18 Leonis | 6 | 2 38 | 14 59 | 164 | 115 | Star 0′.8 | south of | ☽'s | limb. | |
| 20 | B. A. C. 4739‡ | 6½ | 18 53 | 6 53 | 280 | 327 | 19 49 | 7 49 | 43 | 94 | 0 56 |
| 29 | 42 Aquarii | 6 | 2 50 | 14 12 | 315 | 3 | 3 49 | 15 11 | 109 | 160 | 0 59 |
| 30 | 81 Aquarii | 6 | 2 55 | 14 14 | 10 | 55 | 3 25 | 14 43 | 62 | 109 | 0 29 |
| Oct. 5 | 47 Arietis | 6 | 20 42 | 7 42 | 297 | 244 | 21 37 | 8 36 | 117 | 62 | 0 54 |
| 9 | 47 Geminor.† | 6 | 23 22 | 10 6 | 316 | 271 | 23 57 | 10 40 | 45 | 356 | 0 34 |
| 27 | 64 Aquarii | 6½ | 1 12 | 10 45 | 336 | 11 | 2 17 | 11 50 | 101 | 143 | 1 4 |
| 28 | 96 Aquarii | 5½ | 21 18 | 6 47 | 5 | 337 | 22 2 | 7 31 | 72 | 53 | 0 45 |
| 28 | B. A. C. 8134 | 6½ | 23 9 | 8 38 | 12 | 10 | 23 50 | 9 19 | 72 | 82 | 0 41 |
| Nov. 2 | *g* Pleiadum | 5½ | 2 36 | 11 45 | 262 | 225 | 3 44 | 12 53 | 145 | 150 | 1 8 |
| 2 | *b* Pleiadum | 4 | 2 58 | 12 7 | 204 | 179 | Star 1′.0 | south of | ☽'s | limb. | |
| 2 | *e* Pleiadum | 5 | 2 53 | 12 2 | 290 | 260 | 4 13 | 13 21 | 116 | 141 | 1 20 |
| 2 | *c* Pleiadum | 5 | 3 14 | 12 23 | 259 | 242 | 4 20 | 13 28 | 145 | 173 | 1 6 |
| 5 | 47 Geminor. | 6 | 8 27 | 17 23 | 275 | 326 | 9 35 | 18 31 | 49 | 109 | 1 8 |
| 23 | 42 Aquarii | 6 | 22 38 | 6 25 | 316 | 322 | 0 1 | 7 48 | 124 | 149 | 1 23 |
| 24 | 81 Aquarii | 6 | 23 21 | 7 4 | 356 | 3 | 0 22 | 8 5 | 88 | 110 | 1 1 |
| 25 | B. A. C. 8311‡ | 6½ | 5 23 | 13 1 | 265 | 316 | 6 11 | 13 49 | 152 | 203 | 0 48 |
| Dec. 1 | B. A. C. 1648 | 6½ | 1 29 | 8 43 | 323 | 262 | 2 20 | 9 35 | 65 | 4 | 0 51 |
| 1 | B. A. C. 1746 | 6½ | 9 16 | 16 29 | 174 | 235 | Star 2′.3 | south of | ☽'s | limb. | |
| 4 | *γ* Cancri | 4½ | 3 42 | 10 45 | 304 | 248 | 4 25 | 11 28 | 28 | 331 | 0 43 |
| 5 | 8 Leonis‡ | 6 | 2 16 | 9 15 | 306 | 258 | 2 48 | 9 47 | 21 | 331 | 0 32 |
| 7 | *τ* Leonis | 5 | 6 18 | 13 8 | 246 | 196 | 7 21 | 14 12 | 52 | 5 | 1 4 |

## OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT WASHINGTON, D. C., DURING THE YEAR 1876.

| Date. | Star's Name. | Magnitude. | IMMERSION. | | | | EMERSION. | | | | Duration of Occultation. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Washington | | Angle from | | Washington | | Angle from | | |
| | | | Sidereal Time. | Mean Time. | North Point. | Vertex. | Sidereal Time. | Mean Time. | North Point. | Vertex. | |
| | | | h m | h m | ° | ° | h m | h m | ° | ° | h m |
| Dec. 9 | *g* Vriginis | 6 | 9 47 | 16 29 | 199 | 160 | 10 47 | 17 28 | 85 | 55 | 0 59 |
| 26 | *μ* Arietis | 5½ | 1 34 | 7 11 | 336 | 306 | 2 54 | 8 31 | 117 | 127 | 1 20 |
| 27 | *g* Pleiadum | 5½ | 4 6 | 9 38 | 200 | 220 | Star 1′.7 | south of | ☽'s | limb. | |
| 27 | *m* Pleiadum | 7 | 4 14 | 9 47 | 333 | 358 | 5 13 | 10 45 | 65 | 113 | 0 58 |
| 27 | *e* Pleiadum | 5 | 3 56 | 9 28 | 252 | 265 | 5 0 | 10 32 | 146 | 190 | 1 4 |
| 27 | *c* Pleiadum | 5 | 4 44 | 10 16 | 198 | 237 | Star 1′.8 | south of | ☽'s | limb. | |
| 30 | 47 Geminor. | 6 | 6 9 | 11 29 | 227 | 187 | 6 38 | 11 58 | 10 | 348 | 0 29 |

NOTES.—B. A. C., British Association Catalogue.

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

The *Angles of Position*, for the points of contact, are for *direct* vision, and are reckoned from the *North Point* of the Moon's limb towards the west, and from its *Vertex* in the same direction, i. e. towards the right. For *inverted* image, add 180° to the angles given.

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### JANUARY.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle *H* | *Y* | *x′* | *y′* | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| 70 Aquarii | 6 | -0.60 | - 8.0 | -11 12.7 | 1 4 25.5 | + 0 27.1 | +0.7586 | .5048 | +.2531 | +76 | - 5 |
| 81 Aquarii | 6 | 0.56 | 6.6 | 7 43.6 | 11 12.6 | + 7 2.4 | -1.2342 | .5037 | .2596 | -28 | -90 |
| $h^1$ Aquarii | 6 | 0.53 | 6.7 | 8 21.8 | 13 10.5 | + 8 56.8 | -0.0438 | .5035 | .2600 | +41 | -47 |
| $h^2$ Aquarii | 7 | 0.53 | 6.7 | 8 25.4 | 13 15.7 | + 9 1.8 | +0.0426 | .5035 | .2601 | +45 | -42 |
| $h^3$ Aquarii | 7 | 0.53 | 6.8 | 8 36.4 | 13 33.4 | + 9 19.1 | +0.3146 | .5034 | .2603 | +60 | -28 |
| $h^4$ Aquarii | 7½ | 0.52 | 6.6 | 8 21.7 | 14 15.4 | + 9 59.8 | +0.2364 | .5034 | .2608 | +55 | -32 |
| φ Aquarii | 4½ | -0.49 | - 5.9 | - 6 43.1 | 18 0.4 | -10 21.7 | -0.5335 | .5031 | +.2634 | +16 | -77 |
| 96 Aquarii | 5½ | 0.48 | 5.4 | 5 48.2 | 20 40.1 | - 7 46.7 | -0.8046 | .5029 | .2650 | + 2 | -90 |
| B. A. C. 8134 | 6½ | 0.47 | 5.2 | 5 21.1 | 21 43.2 | - 6 45.4 | -1.0046 | .5029 | .2656 | -10 | -90 |
| B. A. C. 8184 | 5½ | 0.43 | 4.9 | 5 12.7 | 2 2 0.3 | - 2 35.7 | -0.0110 | .5026 | .2679 | +43 | -45 |
| MARS | | | | 4 31.8 | 2 27.4 | - 2 9.4 | -0.6119 | .4748 | .2551 | +13 | -83 |
| 20 Piscium | 6 | 0.35 | 3.7 | 3 27.1 | 11 41.1 | + 6 48.2 | +0.7386 | .5034 | .2719 | +84 | - 6 |
| B. A. C. 8311 | 6½ | -0.33 | - 2.7 | - 0 34.9 | 15 16.4 | +10 17.2 | -1.3113 | .5039 | +.2730 | -33 | -90 |
| B. A. C. 8365 | 6½ | 0.27 | 2.4 | - 1 11.5 | 20 38.1 | - 8 30.4 | +0.7995 | .5050 | .2742 | +75 | - 3 |
| B. A. C. 57 | 6½ | 0.24 | 1.0 | + 0 59.9 | 3 3 13.6 | - 2 6.5 | +0.3076 | .5071 | .2749 | +62 | -29 |
| 44 Piscium | 6 | 0.19 | - 0.7 | 1 15.2 | 7 9.3 | + 1 42.2 | +1.1205 | .5083 | .2749 | +90 | +17 |
| 60 Piscium | 6 | 0.11 | + 1.8 | 6 3.9 | 18 19.0 | -11 28.0 | -0.8306 | .5130 | .2733 | + 1 | -84 |
| 62 Piscium | 6 | 0.11 | 2.0 | 6 37.5 | 18 45.7 | -11 2.4 | -1.2906 | .5132 | .2732 | -31 | -84 |
| B. A. C. 221 | 6 | -0.09 | + 1.3 | + 4 38.6 | 18 46.2 | -11 1.9 | +0.7688 | .5132 | +.2732 | +90 | - 4 |
| B. A. C. 274 | 6 | 0.03 | 2.0 | 5 48.8 | 4 0 32.4 | - 5 26.3 | +1.1228 | .5164 | .2713 | +90 | +18 |
| ε Piscium | 4 | -0.03 | 2.8 | 7 13.4 | 2 5.0 | - 3 56.5 | +0.0834 | .5174 | .2707 | +49 | -39 |
| π Piscium | 6 | +0.13 | 5.4 | 11 30.5 | 18 35.0 | -11 57.8 | +0.0648 | .5291 | .2605 | +48 | -38 |
| 19 Arietis | 6 | 0.32 | 7.6 | 14 42.0 | 5 11 5.7 | + 3 59.8 | +0.9777 | .5436 | .2433 | +90 | +14 |
| 27 Arietis | 6 | 0.42 | 8.7 | 17 9.4 | 18 57.0 | +11 34.7 | +0.3565 | .5517 | .2324 | +65 | -19 |
| B. A. C. 782 | 6½ | +0.43 | + 9.1 | +18 20.1 | 20 6.2 | -11 18.6 | -0.5655 | .5529 | +.2306 | +15 | -67 |
| μ Arietis | 5½ | 0.47 | 9.6 | 19 29.1 | 23 51.4 | - 7 41 5 | -0.8690 | .5566 | .2255 | - 3 | -71 |
| 47 Arietis | 6 | 0.57 | 9.9 | 20 10.4 | 6 6 28.1 | - 1 19.3 | -0.1131 | .5639 | .2122 | +38 | -40 |
| ε Arietis, *mult* | 4½ | 0.58 | 10.2 | 20 50.8 | 6 56.3 | - 0 52.1 | -0.6891 | .5644 | .2117 | + 7 | -69 |
| ζ Arietis | 4½ | 0.67 | 10.5 | 20 35.2 | 13 23.4 | + 5 20.3 | +0.8949 | .5716 | .1987 | +90 | +15 |
| $\tau^1$ Arietis | 5 | 0.71 | 10.5 | 20 42.1 | 15 56.3 | + 7 47.3 | +1.2750 | .5744 | .1931 | +90 | +48 |
| 66 Arietis | 6½ | +0.74 | +11.1 | +22 22.7 | 18 48.0 | +10 32.4 | +0.1461 | .5775 | +.1867 | +53 | -24 |
| 7 Tauri, *mult*. | 6 | 0.77 | 11.6 | 24 3.0 | 21 8.7 | -11 12.4 | -1.0887 | .5801 | .1813 | -20 | -66 |
| 9 Tauri | 6 | 0.80 | 11.3 | 22 48.2 | 22 9.7 | -10 13.9 | +0.3369 | .5812 | .1777 | +65 | -13 |
| *g* Pleiadum | 5½ | 0.84 | 11.5 | 23 54.1 | 7 1 12.2 | - 7 18.7 | -0.2252 | .5849 | .1711 | +33 | -41 |
| *b* Pleiadum | 4 | 0.83 | 11.5 | 23 43.5 | 1 14.0 | - 7 16.9 | -0.0452 | .5850 | .1709 | +42 | -32 |
| *m* Pleiadum | 7 | 0.84 | 11.6 | 24 27.1 | 1 19.9 | - 7 11.2 | -0.7502 | .5851 | .1706 | + 3 | -64 |
| *e* Pleiadum | 5 | +0.83 | +11.5 | +24 4.8 | 1 21.4 | - 7 9.7 | -0.3766 | .5851 | +.1706 | +24 | -49 |
| *c* Pleiadum | 5 | 0.83 | 11.5 | 23 58.9 | 1 35.9 | - 6 55.9 | -0.2546 | .5850 | .1700 | +31 | -42 |
| *d* Pleiadum | 5 | 0.84 | 11.4 | 23 33.8 | 1 48.0 | - 6 44.3 | +0.2121 | .5852 | .1695 | +57 | -19 |
| η Tauri | 3 | 0.85 | 11.4 | 23 43.4 | 2 14.7 | - 6 18.6 | +0.1284 | .5857 | .1684 | +52 | -23 |
| *f* Pleiadum | 4 | 0.86 | 11.5 | 23 40.6 | 2 53.8 | - 5 41.1 | +0.2849 | .5863 | .1667 | +62 | -15 |
| *h* Pleiadum | 5½ | 0.86 | 11.5 | 23 45.6 | 2 54.2 | - 5 40.7 | +0.2023 | .5863 | .1666 | +57 | -19 |
| B. A. C. 1192 | 6½ | +0.86 | +11.8 | +25 12.3 | 3 18.8 | - 5 17.1 | -1.1665 | .5868 | +.1656 | -29 | -65 |
| 36 Tauri | 6½ | 0.95 | 11.4 | 23 46.0 | 8 42.5 | - 0 6.6 | +1.1161 | .5923 | .1510 | +90 | +35 |
| *p* Tauri | 6 | 0.98 | 12.0 | 26 9.6 | 11 6.5 | + 2 11.5 | -0.9022 | .5947 | .1441 | - 8 | -64 |
| φ Tauri, *mult.* | 5 | 1.05 | 12.1 | 27 3.4 | 14 38.8 | + 5 35.0 | -1.2969 | .5980 | .1337 | -53 | -63 |
| $\chi^1$ Tauri | 5½ | 1.05 | 11.7 | 25 20.3 | 15 30.4 | + 6 24.3 | +0.5178 | .5988 | .1311 | +79 | + 1 |
| $\chi^2$ Tauri | 8½ | 1.05 | 11.7 | 25 20.5 | 15 30.6 | + 6 24.5 | +0.5136 | .5988 | .1311 | +79 | + 1 |
| B. A. C. 1648 | 6½ | +1.36 | +10.8 | +27 49.9 | 8 12 32.7 | + 2 32.0 | +0.1032 | .6063 | +.0618 | +51 | -14 |
| β Tauri | 2 | 1.40 | 10.8 | 28 30.2 | 14 24.0 | + 4 18.3 | -0.4486 | .6151 | .0550 | +19 | -43 |
| B. A. C. 1709 | 6½ | 1.42 | 10.8 | 29 5.3 | 15 34.7 | + 5 25.9 | -0.9618 | .6156 | .0510 | -14 | -61 |
| B. A. C. 1746 | 6½ | 1.43 | 10.4 | 27 35.0 | 17 48.5 | + 7 33.7 | +0.6234 | .6165 | .0431 | +90 | +14 |
| B. A. C. 1772 | 6 | 1.46 | 10.5 | 29 8.7 | 18 57.5 | + 8 39.6 | -0.8650 | .6169 | .0386 | - 7 | -61 |
| 136 Tauri | 5 | +1.50 | + 9.8 | +27 35.0 | 23 53.8 | -10 37.5 | +0.8158 | .6184 | +.0207 | +90 | +27 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### JANUARY.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. $\Delta\alpha$ | $\Delta\delta$ | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | $Y$ | $x'$ | $y'$ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| B. A. C. 1882 | 6½ | +1.53 | +9.8 | +28 55.4 | 9 0 59.8 | − 9 34.4 | −0.4795 | .6186 | +.0166 | +17 | −43 |
| κ Aurigæ | 4½ | 1.60 | 8.9 | 29 32.6 | 7 32.9 | − 3 19.0 | −1.0600 | .6193 | −.0078 | −22 | −61 |
| B. A. C. 2097 | 6½ | 1.64 | 8.2 | 28 17.6 | 12 48.0 | + 1 41.9 | +0.0760 | .6194 | .0270 | +49 | −12 |
| 49 Aurigæ | 5½ | 1.65 | 8.0 | 28 7 1 | 14 29.6 | + 3 18.9 | +0.1957 | .6186 | .0333 | +56 | − 7 |
| 53 Aurigæ | 6 | 1.66 | 7.9 | 29 5.4 | 15 35.1 | + 4 21.5 | −0.7958 | .6184 | .0373 | − 2 | −61 |
| 54 Aurigæ | 6 | 1.65 | 7.9 | 28 22.4 | 16 0.6 | + 4 45.8 | −0.1077 | .6183 | .0394 | +38 | −23 |
| 28 Geminor. | 6 | +1.68 | +7.6 | +29 5.8 | 17 49.1 | + 6 29.5 | −0.8949 | .6178 | −.0463 | − 8 | −61 |
| 47 Geminor. | 6 | 1.70 | 6.3 | 27 3.6 | 10 3 15.4 | − 8 29.4 | +0.5151 | .6141 | .0792 | +80 | + 6 |
| 53 Geminor. | 6 | 1.72 | 6.0 | 28 6.8 | 4 51.7 | − 6 57.4 | −0.6509 | .6129 | .0848 | + 8 | −59 |
| 59 Geminor. | 6½ | 1.74 | 5.4 | 27 52.6 | 7 56.6 | − 4 0.6 | −0.6976 | .6110 | .0954 | + 5 | −62 |
| ι Geminorum | 4 | 1.74 | 5.2 | 28 2.6 | 8 22.0 | − 3 36.4 | −0.9022 | .6108 | .0968 | − 9 | −62 |
| $b^2$ Geminorum | 5½ | 1.75 | 5.1 | 28 10.3 | 9 49.8 | − 2 12.3 | −1.1733 | .6099 | .1018 | −32 | −62 |
| B. A. C. 2472 | 6 | +1.75 | +5.0 | +28 10.5 | 10 8.1 | − 1 54.9 | −1.2070 | .6098 | −.1028 | −37 | −62 |
| υ Geminorum | 4½ | 1.74 | 4.8 | 27 10.3 | 12 3.5 | − 0 4.5 | −0.4237 | .6087 | .1090 | +21 | −46 |
| c Geminorum | 4½ | 1.73 | 4.3 | 26 4.7 | 15 3.4 | + 2 47.6 | +0.3099 | .6062 | .1188 | +64 | − 9 |
| φ Geminorum | 5 | 1.75 | 3.7 | 27 5.1 | 18 28.7 | + 6 4.2 | −1.1079 | .6032 | .1296 | −24 | −63 |
| $\omega^1$ Cancri | 6 | 1.73 | 3.4 | 25 43.9 | 21 15.2 | + 8 43.5 | −0.1447 | .6007 | .1381 | +36 | −34 |
| $\omega^2$ Cancri | 6½ | 1.72 | 3.4 | 25 25.8 | 21 33.5 | + 9 1.0 | +0.1117 | .6005 | .1391 | +51 | −21 |
| $\psi^1$ Cancri | 6½ | +1 74 | +2.8 | +26 12.5 | 11 0 42.8 | −11 57.6 | −1.1125 | .5976 | −.1465 | −24 | −64 |
| $\psi^2$ Cancri | 4 | 1.74 | 2.9 | 25 53.0 | 0 48.7 | −11 52.1 | −0.8043 | .5976 | .1485 | 0 | −64 |
| λ Cancri | 6 | 1.70 | 2.4 | 24 24.7 | 4 38.7 | − 8 11.5 | +0.0591 | .5938 | .1598 | +48 | −25 |
| $\upsilon^1$ Cancri, *mult.* | 7 | 1.71 | 2.0 | 24 56.3 | 6 58.6 | − 5 57.3 | −0.8422 | .5915 | .1660 | − 3 | −65 |
| $\upsilon^2$ Cancri | 6½ | 1.70 | 1.8 | 24 33.3 | 7 43.9 | − 5 13.9 | −0.5886 | .5907 | .1681 | +12 | −61 |
| $\upsilon^3$ Cancri | 6 | 1.70 | 1.5 | 24 29.8 | 8 51.0 | − 4 9.5 | −0.7211 | .5896 | .1711 | + 4 | −66 |
| 32 Cancri | 6 | +1.70 | +1.5 | +24 30.3 | 9 25.4 | − 3 36.5 | −0.8272 | .5890 | −.1728 | − 2 | −66 |
| γ Cancri | 4½ | 1.63 | +1.1 | 21 54.8 | 13 28.6 | + 0 17.0 | +1.0228 | .5848 | .1827 | +90 | +25 |
| B. A. C. 3138 | 6 | 1.59 | −0.7 | 21 47.6 | 12 1 38.6 | +11 58.4 | −1.2534 | .5712 | .2100 | −35 | −68 |
| 34 Leonis | 6 | 1.31 | 2.6 | 13 57.9 | 13 2 42.7 | −11 51.7 | +0.8067 | .5445 | .2500 | +90 | + 2 |
| 37 Leonis | 6 | 1.31 | 3.0 | 14 20.7 | 4 59.6 | − 9 39.4 | −0.1511 | .5422 | .2526 | +37 | −48 |
| l Leonis | 5 | 1.15 | 4.1 | 11 12.0 | 20 13.1 | + 5 3.7 | −0.8997 | .5282 | .2659 | − 3 | −79 |
| χ Leonis | 5 | +1.04 | −4.0 | + 8 0.3 | 14 3 53.1 | −11 30.8 | +0.3189 | .5221 | −.2702 | +62 | −27 |
| σ Leonis | 4 | 0.96 | 4.5 | 6 42.4 | 11 49.8 | − 3 48.9 | −0.5035 | .5164 | .2732 | +19 | −73 |
| 89 Leonis | 6 | 0.88 | 4.2 | 3 44.8 | 18 30.6 | + 2 39.7 | +0.7391 | .5122 | .2735 | +90 | − 6 |
| β Virginis | 3½ | 0.78 | 4.6 | 2 27.7 | 15 2 47.3 | +10 41.5 | −0.1945 | .5080 | .2749 | +34 | −55 |
| B. A. C. 4043 | 6½ | 0.73 | 4.6 | + 1 13.2 | 7 9.8 | − 9 3.7 | −0.0959 | .5061 | .2746 | +40 | −50 |
| B. A. C. 4200 | 6½ | 0.54 | 4.2 | − 3 55.8 | 22 14.6 | + 5 34.7 | +1.2226 | .5008 | .2710 | +86 | +24 |
| B. A. C. 4225 | 6½ | +0.52 | −4.1 | − 4 22.2 | 16 0 14.4 | + 7 31.1 | +1.1503 | .5004 | −.2702 | +86 | +19 |
| f Virginis | 6 | 0.48 | 4.1 | 5 9.1 | 2 57.9 | +10 9.9 | +1.2480 | .5000 | .2690 | +85 | +27 |
| B. A. C. 4255 | 6½ | 0.49 | 4.7 | 3 41.5 | 3 59.7 | +11 9.9 | −0.5812 | .4998 | .2685 | +15 | −80 |
| B. A. C. 4294 | 6½ | 0.43 | 4.3 | 5 37.4 | 8 40.3 | − 8 17.5 | +0.2279 | .4990 | .2660 | +56 | −33 |
| B. A. C. 4394 | 6 | 0.30 | 4.2 | 8 19.3 | 19 49.8 | + 2 33.0 | +0.1897 | .4983 | .2588 | +53 | −35 |
| 58 Virginis | 6 | 0.24 | 3.9 | 9 53.7 | 17 0 34.0 | + 7 9.0 | +0.6651 | .4984 | .2551 | +80 | −10 |
| α Virginis | 1 | +0.20 | −4.0 | −10 30.9 | 4 40.2 | +11 8.2 | +0.2938 | .4988 | −.2517 | +58 | −29 |
| B. A. C. 4531 | 6 | 0.12 | 3.5 | 12 34.8 | 9 41.1 | − 7 59.5 | +1.2759 | .4994 | .2495 | +78 | +31 |
| 86 Virginis | 6 | +0.08 | 4.2 | 11 48.3 | 15 38.6 | − 2 12.2 | −1.0181 | .5004 | .2435 | −14 | −90 |
| B. A. C. 4679 | 6½ | −0.03 | 4.0 | 14 22.5 | 18 1 20.3 | + 7 12.7 | −0.5151 | .5027 | .2307 | +13 | −76 |
| B. A. C. 4700 | 5½ | 0.08 | 3.9 | 15 43.0 | 4 38.8 | +10 25.3 | +0.1919 | .5037 | .2268 | +49 | −35 |
| B. A. C. 4923 | 6 | 0.34 | 3.7 | 20 51.3 | 19 4 20.7 | + 9 25.0 | +0 8316 | .5127 | .1937 | +69 | + 1 |
| B. A. C. 5023 | 6 | −0.42 | −4.0 | −21 56.5 | 13 49.8 | − 5 23.4 | +0.2670 | .5173 | −.1780 | +46 | −30 |
| 42 Libræ | 5½ | 0.54 | 4.5 | 23 24.9 | 20 1 28.9 | + 5 54.0 | −0.0578 | .5231 | .1571 | +27 | −48 |
| B. A. C. 5197 | 6 | 0.57 | 4.2 | 24 19.5 | 4 8.7 | + 8 28.7 | +0.5386 | .5244 | .1519 | +58 | −15 |
| $A^2$ Scorp., *mult.* | 5 | 0.62 | 4.3 | 24 57.4 | 7 51.4 | −11 55.8 | +0.6885 | .5263 | .1446 | +66 | − 6 |
| B. A. C. 5253 | 6 | 0.61 | 4.7 | 24 9.8 | 8 0.7 | −11 46.7 | −0.2128 | .5263 | .1444 | +18 | −57 |
| B. A. C. 5254 | 6 | −0.60 | −4.9 | −23 36.4 | 8 2.4 | −11 45.0 | +0.8321 | .5264 | −.1440 | −15 | −90 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### JANUARY.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | $Y$ | $x'$ | $y'$ | N'n. | S'n. |
| | | Δα | Δδ | | | | | | | | |
| | | s | " | ° ′ | d h m | h m | | | | ° | ° |
| B. A. C. 5255 | 6 | -0.62 | -4.4 | -25 2.5 | 20 8 8.3 | -11 39.3 | +0.7422 | .5264 | -.1440 | +64 | - 3 |
| 3 Scorpii | 6 | 0.62 | 4.4 | 24 52.6 | 8 21.5 | -11 26.6 | +0.5286 | .5265 | .1436 | +57 | -16 |
| B. A. C. 5286 | 6½ | 0.64 | 4.7 | 24 28.9 | 10 14.2 | - 9 37.5 | -0.1830 | .5275 | .1398 | +19 | -56 |
| π Scorpii | 3 | 0.65 | 4.3 | 25 45.4 | 10 20.1 | - 9 31.8 | +1.2235 | .5275 | .1396 | +64 | +36 |
| B. A. C. 5314 | 6 | 0.67 | 4.5 | 25 31.2 | 12 28.7 | - 7 27.3 | +0.6670 | .5286 | .1353 | +63 | - 7 |
| B. A. C. 5347 | 5 | 0.68 | 4.7 | 25 59.7 | 14 43.1 | - 5 17.4 | +0.9007 | .5298 | .1308 | +64 | + 7 |
| σ Scorpii | 3½ | -0.68 | -5.4 | -25 17.7 | 20 52.6 | + 0 40.1 | -0.6458 | .5327 | -.1176 | - 8 | -90 |
| α Scorpii | 1½ | 0.76 | 5.4 | 26 9.4 | 21 0 41.2 | + 4 21.2 | -0.1211 | .5344 | .1092 | +19 | -52 |
| B. A. C. 5800 | 6½ | 0.90 | 6.6 | 26 50.1 | 21 10.6 | + 0 9.3 | -1.1207 | .5430 | .0613 | -43 | -90 |
| 43 Ophiuchi | 6 | 0.92 | 6.6 | 28 1.3 | 22 1 15.5 | + 4 5.8 | -0.0340 | .5444 | .0511 | +17 | -47 |
| 3 Sagittarii | 5 | 0.99 | 7.4 | 27 47.0 | 12 5.5 | - 9 26.6 | -0.7053 | .5471 | .0239 | -20 | -90 |
| B. A. C. 6063 | 6½ | 1.00 | 7.6 | 28 2.8 | 16 9.6 | - 5 31.0 | -0.4886 | .5478 | .0134 | -10 | -78 |
| B. A. C. 6072 | 6½ | -1.00 | -7.6 | -28 44.5 | 17 0.2 | - 4 42.2 | +0.2713 | .5480 | -.0114 | +30 | -29 |
| $\gamma^1$ Sagittarii | 4 | 1.02 | 7.6 | 29 35.2 | 19 48.9 | - 1 59.3 | +1.1814 | .5483 | .0040 | +61 | +35 |
| B. A. C. 6120 | 6½ | 1.02 | 7.9 | 28 22.3 | 20 37.7 | - 1 12.2 | -0.1624 | .5484 | .0019 | + 6 | -54 |
| B. A. C. 6127 | 5 | 1.02 | 7.9 | 28 28.2 | 21 12.1 | - 0 39.0 | -0.0535 | .5485 | -.0006 | +12 | -48 |
| B. A. C. 6190 | 6½ | 1.03 | 8.1 | 28 41.6 | 23 1 19.7 | + 3 20.0 | +0.2120 | .5489 | +.0102 | +26 | -32 |
| B. A. C. 6191 | 6½ | 1.03 | 8.2 | 28 19.6 | 1 20.1 | + 3 20.4 | -0.1932 | .5489 | .0102 | + 5 | -56 |
| B. A. C. 6220 | 6½ | -1.04 | -8.4 | -28 29.4 | 3 22.9 | - 5 18.9 | -0.0132 | .5490 | +.0153 | +16 | -44 |
| φ Sagittarii | 3½ | 1.05 | 9.1 | 27 7.1 | 13 55.0 | - 8 31.1 | -1.1965 | .5487 | .0427 | -52 | -90 |
| τ Sagittarii | 3½ | 1.06 | 9.7 | 27 51.1 | 23 23.1 | + 0 37.2 | +0.1320 | .5477 | .0666 | +27 | -37 |
| 42 Aquarii | 6 | 0.79 | 9.5 | 13 27.0 | 27 17 47.9 | - 7 53.9 | -0.7006 | .5128 | .2401 | + 4 | -90 |
| 45 Aquarii | 6 | 0.78 | 9.5 | 13 55.6 | 18 55.2 | - 6 48.7 | +0.0816 | .5124 | .2414 | +44 | -40 |
| 50 Aquarii | 6 | 0.76 | 9.4 | 14 9.6 | 21 42.1 | - 4 6.8 | +1.0076 | .5114 | .2444 | +76 | +10 |
| B. A. C. 7835 | 6½ | -0.75 | -9.1 | -13 33.1 | 28 0 33.8 | - 1 20.3 | +1.0568 | .5105 | +.2474 | +77 | +13 |
| σ Aquarii | 4½ | 0.77 | 8.9 | 11 18.8 | 0 55.1 | - 0 59.6 | -1.2578 | .5103 | .2478 | -32 | -90 |
| 58 Aquarii | 6 | 0.76 | 8.9 | 11 32.5 | 1 26.9 | - 0 28.7 | -0.8810 | .5102 | .2485 | - 5 | -90 |
| 64 Aquarii | 6½ | 0.75 | 8.6 | 10 40.5 | 5 22.5 | + 3 19.9 | -0.8272 | .5090 | .2520 | - 1 | -90 |
| 70 Aquarii | 6 | 0.71 | 8.5 | 11 12.7 | 10 9.1 | + 7 58.0 | +0.9629 | .5077 | .2564 | +79 | + 7 |
| VENUS | | | | 9 21.3 | 12 19.9 | +10 5.0 | -0.4615 | .4577 | .2370 | +20 | -72 |
| 81 Aquarii | 6 | -0.69 | -7.5 | - 7 43.6 | 16 53.6 | - 9 29.3 | -1.0146 | .5061 | +.2615 | -11 | -90 |
| 82 Aquarii | 6 | 0.69 | 7.3 | 7 14.4 | 17 29.7 | - 8 54.3 | -1.3763 | .5060 | .2619 | -44 | -90 |
| $h^1$ Aquarii | 6 | 0.67 | 7.4 | 8 21.8 | 18 50.9 | - 7 35.5 | +0.1778 | .5058 | .2629 | +52 | -35 |
| $h^2$ Aquarii | 7 | 0.67 | 7.4 | 8 25.4 | 18 56.0 | - 7 30.5 | +0.2644 | .5058 | .2630 | +57 | -31 |
| $h^3$ Aquarii | 7 | 0.67 | 7.4 | 8 36.4 | 19 13.6 | - 7 13.3 | +0.5364 | .5057 | .2632 | +74 | -17 |
| $h^4$ Aquarii | 7½ | 0.67 | 7.3 | 8 21.8 | 19 55.4 | - 6 32.7 | +0.4597 | .5056 | .2636 | +69 | -21 |
| φ Aquarii | 4½ | -0.66 | -6.8 | - 8 43.1 | 23 39.3 | - 2 55.4 | -0.3032 | .5051 | +.2660 | +28 | -62 |
| 96 Aquarii | 5½ | 0.64 | 6.5 | 5 48.2 | 29 2 18.4 | - 0 21.0 | -0.5698 | .5047 | .2675 | -15 | -80 |
| B. A. C. 8134 | 6½ | 0.64 | 6.3 | 5 21.1 | 3 21.1 | + 0 39.9 | -0.7684 | .5045 | .2680 | + 4 | -90 |
| B. A. C. 8184 | 5½ | 0.61 | 6.0 | 5 12.7 | 7 37.4 | + 4 48.8 | +0.2317 | .5044 | .2703 | +57 | -33 |
| 20 Piscium | 6 | 0.55 | 4.9 | 3 27.1 | 17 17.5 | - 9 48.0 | +0.9961 | .5044 | .2737 | +87 | + 8 |
| B. A. C. 8311 | 6½ | 0.55 | 3.9 | 0 34.9 | 20 52.8 | - 6 19.0 | -1.0539 | .5046 | .2746 | -12 | -90 |
| B. A. C. 8365 | 6½ | -0.51 | -3.8 | - 1 11.6 | 30 2 15.1 | - 1 6.1 | +1.0676 | .5053 | +.2754 | +89 | +13 |
| B. A. C. 57 | 6½ | 0.47 | 2.6 | + 0 59.9 | 8 51.9 | + 5 19.1 | +0.5808 | .5065 | .2756 | +80 | -15 |
| 44 Piscium | 6 | 0.43 | -2.2 | 1 15.2 | 12 48.9 | + 9 9.2 | +1.4009 | .5075 | .2754 | +90 | +45 |
| MARS | | | | 4 10.1 | 23 18.0 | - 4 40.6 | +1.2156 | .4834 | .2604 | +90 | +24 |
| 60 Piscium | 6 | 0.38 | 0.0 | 6 3.8 | 31 0 3.9 | - 3 56.1 | -0.5539 | .5077 | .2730 | +16 | -77 |
| 62 Piscium | 6 | 0.38 | +0.2 | 6 37.4 | 0 30.6 | - 3 30.2 | -1.0170 | .5113 | .2728 | -10 | -84 |
| B. A. C. 221 | 6 | -0.36 | -0.4 | + 4 38.5 | 0 31.1 | - 3 29.7 | +1.0556 | .5114 | +.2728 | +90 | +13 |
| δ Piscium | 4½ | 0.38 | +0.4 | 6 54.6 | 0 42.6 | - 3 18.4 | -1.2618 | .5114 | .2728 | -28 | -83 |
| B. A. C. 274 | 6 | 0.31 | 0.5 | 5 48.8 | 6 21.1 | + 2 9.8 | +1.4151 | .5138 | .2704 | +90 | +50 |
| ε Piscium | 4 | -0.32 | +1.1 | + 7 13.3 | 7 54.8 | + 3 40.6 | +0.3680 | .5145 | +.2697 | +65 | -24 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### FEBRUARY.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| π Piscium | 6 | -0.18 | + 3.8 | +11 30.5 | 1 0 40.2 | - 4 5.1 | +0.3483 | .5241 | +.2583 | +64 | -24 |
| 19 Arietis | 7 | +0.00 | 6.2 | 14 42.0 | 17 32.4 | -11 46.0 | +1.2644 | .5369 | .2399 | +90 | +36 |
| 27 Arietis | 6 | 0.08 | 7.6 | 17 09.4 | 2 1 35.7 | - 3 59.1 | +0.6285 | .5438 | .2285 | +87 | - 5 |
| B. A. C. 782 | 6½ | 0.10 | 8.1 | 18 20.1 | 2 46.8 | - 2 50.5 | -0.3079 | .5449 | .2267 | +28 | -53 |
| μ Arietis | 5½ | 0.15 | 8.6 | 19 29.1 | 6 38.4 | + 0 53.0 | -0.6203 | .5485 | .2204 | +12 | -69 |
| 47 Arietis | 6 | 0.24 | 9.3 | 20 10.3 | 13 26.7 | + 7 26.8 | +0.1387 | .5549 | .2084 | +53 | -27 |
| ε Arietis, *mult.* | 4½ | +0.24 | + 9.6 | +20 50.8 | 13 56.0 | + 7 55.1 | -0.4466 | .5554 | +.2075 | +21 | -58 |
| ζ Arietis | 4½ | 0.36 | 9.7 | 20 35.2 | 20 35.0 | - 9 40.4 | +1.1540 | .5617 | .1944 | +90 | +33 |
| 66 Arietis | 6½ | 0.43 | 10.5 | 22 22.7 | 3 2 10.2 | - 4 17.7 | +0.3853 | .5672 | .1822 | +68 | -12 |
| 7 Tauri, *mult.* | 6 | 0.47 | 11.3 | 24 3.0 | 4 35.7 | - 1 57.7 | -0.8738 | .5695 | .1768 | - 5 | -66 |
| 9 Tauri | 6 | 0.48 | 10.9 | 22 48.1 | 5 38.7 | - 0 57.1 | +0.5743 | .5706 | .1742 | +84 | - 1 |
| 11 Tauri | 6 | 0.51 | 11.5 | 24 55.8 | 7 8.7 | + 0 29.4 | -1.3213 | .5720 | .1706 | -54 | -65 |
| *g* Pleiadum | 5½ | +0.55 | +11.3 | +23 54.1 | 8 47.5 | + 2 4 5 | -0.0019 | .5735 | +.1667 | +45 | -29 |
| *b* Pleiadum | 4 | 0.55 | 11.3 | 23 43.5 | 8 49.4 | + 2 6.3 | +0.1811 | .5736 | .1665 | +55 | -20 |
| *m* Pleiadum | 7 | 0.54 | 11.5 | 24 27.1 | 8 55.4 | + 2 12.0 | -0.5363 | .5737 | .1663 | +15 | -58 |
| *e* Pleiadum | 5 | 0.55 | 11.4 | 24 4.8 | 8 57.0 | + 2 13.6 | -0.1566 | .5737 | .1663 | +36 | -37 |
| *c* Pleiadum | 5 | 0.56 | 11.4 | 23 58.9 | 9 12.0 | + 2 28.0 | -0.0160 | .5739 | .1658 | +44 | -30 |
| *d* Pleiadum | 5 | 0.55 | 11.2 | 23 33.8 | 9 24.5 | + 2 40.0 | +0.4415 | .5740 | .1653 | +73 | - 7 |
| η Tauri | 3 | +0.56 | +11.2 | +23 43.4 | 9 52.2 | + 3 6.7 | +0.3560 | .5745 | +.1640 | +66 | -11 |
| *f* Pleiadum | 4 | 0.58 | 11.2 | 23 40.5 | 10 32.5 | + 3 45.4 | +0.5140 | .5752 | .1622 | +79 | - 3 |
| *h* Pleiadum | 5½ | 0.58 | 11.3 | 23 45.6 | 10 33.0 | + 3 45.9 | +0.4305 | .5752 | .1622 | +72 | - 7 |
| B. A. C. 1192 | 6½ | 0.57 | 11.7 | 25 12.3 | 11 58.4 | + 5 10.3 | -0.9629 | .5756 | .1612 | -11 | -65 |
| *p* Tauri | 6 | 0.72 | 12.1 | 26 9.6 | 19 2.5 | +11 55.2 | -0.7078 | .5832 | .1400 | + 5 | -64 |
| φ Tauri, *mult.* | 5 | 0.79 | 12.2 | 27 3.4 | 22 42.4 | - 8 33.7 | -1.1158 | .5863 | .1298 | -25 | -63 |
| $\chi^1$ Tauri | 5½ | +0.80 | +11.8 | +25 20.3 | 23 35.9 | - 7 42.4 | +0.7295 | .5871 | +.1273 | +90 | +12 |
| $\chi^2$ Tauri | 8½ | 0.80 | 11.8 | 25 20.5 | 23 36.0 | - 7 42.3 | +0.7248 | .5871 | .1273 | +90 | +12 |
| B. A. C. 1648 | 6½ | 1.21 | 11.7 | 27 49.9 | 4 21 23.5 | -10 49.3 | +0.2672 | .6027 | .0589 | +61 | - 5 |
| β Tauri | 2 | 1.25 | 11.8 | 28 30.2 | 23 18.7 | - 8 59.1 | -0.2979 | .6036 | .0524 | +28 | -35 |
| B. A. C. 1709 | 6½ | 1.27 | 11.8 | 29 5.3 | 5 0 31.9 | - 7 49.0 | -0.8207 | .6043 | .0479 | - 3 | -61 |
| B. A. C. 1746 | 6½ | 1.31 | 11.4 | 27 35.0 | 2 50.4 | - 5 36.5 | +0.7850 | .6052 | .0401 | +90 | +23 |
| B. A. C. 1772 | 6 | +1.34 | +11.6 | +29 8.7 | 4 1.8 | - 4 28.1 | -0.7303 | .6055 | +.0360 | + 2 | -61 |
| 136 Tauri | 5 | 1.41 | 10.7 | 27 35.0 | 9 8.2 | + 0 25.0 | +0.9676 | .6072 | .0182 | +90 | +36 |
| B. A. C. 1882 | 6½ | 1.45 | 11.0 | 28 55.4 | 10 16.4 | + 1 30.2 | -0.3506 | .6074 | +.0140 | +25 | -34 |
| κ Aurigæ | 4½ | 1.56 | 10.6 | 29 32.7 | 17 2.4 | + 7 58.5 | -0.9539 | .6085 | -.0097 | -13 | -61 |
| B. A. C. 2097 | 6½ | 1.63 | 9.5 | 28 17.6 | 22 27.4 | -10 50.7 | +0.1883 | .6087 | .0289 | +56 | - 7 |
| 49 Aurigæ | 5½ | 1.65 | 9.2 | 28 7.2 | 6 0 12.1 | - 9 10.5 | +0.3061 | .6088 | .0349 | +64 | - 1 |
| 53 Aurigæ | 6 | +1.68 | + 9.4 | +29 5.4 | 1 19.6 | - 8 5.9 | -0.7023 | .6084 | -.0391 | + 4 | -60 |
| 54 Aurigæ | 6 | 1.68 | 9.1 | 28 22.4 | 1 45.9 | - 7 40.9 | -0.0052 | .6083 | .0405 | +44 | -18 |
| 28 Geminor. | 6 | 1.72 | 9.1 | 29 5.8 | 3 37.6 | - 5 53.9 | -0.8069 | .6081 | .0481 | - 2 | -61 |
| 47 Geminor. | 6 | 1.81 | 7.2 | 27 3.6 | 13 19.7 | + 3 22.9 | +0.6006 | .6052 | .0808 | +89 | +10 |
| 53 Geminor. | 6 | 1.85 | 7.1 | 28 6.8 | 14 58.5 | + 4 57.5 | -0.5837 | .6045 | .0859 | +12 | -54 |
| 59 Geminor. | 6½ | 1.88 | 6.5 | 27 52.6 | 18 7.9 | + 7 58.7 | -0.6369 | .6030 | .0965 | + 9 | -59 |
| ι Geminor. | 4 | +1.89 | + 6.4 | +28 2.7 | 18 34.0 | + 8 23.7 | -0.8453 | .6028 | -.0978 | - 5 | -62 |
| $b^3$ Geminor. | 5 | 1.91 | 6.3 | 28 10.3 | 20 3.9 | + 9 49.8 | -1.1228 | .6020 | .1027 | -27 | -62 |
| B. A. C. 2472 | 6 | 1.91 | 6.2 | 28 10.5 | 20 22.7 | +10 7.7 | -1.1577 | .6018 | .1037 | -31 | -62 |
| υ Geminor. | 4½ | 1.91 | 5.8 | 27 10.3 | 22 20.7 | -11 59.2 | -0.3697 | .6007 | .1102 | +24 | -43 |
| *c* Geminor. | 6 | 1.92 | 5.1 | 26 4.7 | 7 1 24.7 | - 9 3.0 | +0.3648 | .5989 | .1197 | +68 | - 6 |
| φ Geminor. | 5 | 1.97 | 4.6 | 27 5.2 | 4 54.3 | - 5 42.2 | -1.0755 | .5966 | .1305 | -21 | -63 |
| $\omega^1$ Cancri | 6 | +1.97 | + 4.0 | +25 43.9 | 7 44.1 | - 2 59.5 | -0.1091 | .5946 | -.1392 | +38 | -32 |
| $\omega^2$ Cancri | 6½ | 1.96 | 3.8 | 25 25.8 | 8 2.7 | - 2 41.6 | +0.1490 | .5943 | .1401 | +53 | -19 |
| $\psi^1$ Cancri | 6½ | 2.00 | 3.4 | 26 12.5 | 11 15.5 | + 0 32.0 | -1.0932 | .5920 | .1495 | -22 | -64 |
| $\psi^2$ Cancri | 4 | 2.00 | 3.4 | 25 53.0 | 11 21.5 | + 0 29.0 | -0.7838 | .5920 | .1498 | 0 | -64 |
| λ Cancri | 6 | 1.99 | 2.5 | 24 24.7 | 15 15.4 | + 4 13.3 | +0.0777 | .5889 | .1607 | +49 | -24 |
| $\nu^1$ Cancri, *mult.* | 7 | +2.01 | + 2.3 | +24 56.3 | 17 37.5 | + 6 29.8 | -0.8360 | .5867 | -.1672 | - 3 | -65 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### FEBRUARY.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| υ² Cancri | 5½ | +2.01 | +2.1 | +24 33.3 | **7** 18 23.3 | + 7 13.7 | −0.5820 | .5861 | −.1691 | +13 | −61 |
| υ³ Cancri | 6 | 2.01 | 1.9 | 24 29.8 | 19 31.6 | + 8 19.3 | −0.7185 | .5851 | .1722 | + 5 | −66 |
| 32 Cancri | 6 | 2.02 | 1.7 | 24 30.3 | 20 6.6 | + 8 52.9 | −0.8277 | .5846 | .1735 | − 2 | −66 |
| γ Cancri | 4½ | 1.98 | +0.9 | 21 54.8 | **8** 0 12.8 | −11 10.6 | +1.0247 | .5811 | .1840 | +90 | +25 |
| B. A. C. 3138 | 6 | 2.01 | −1.2 | 21 47.6 | 12 29.5 | + 0 37.6 | −1.2909 | .5697 | .2119 | −40 | −68 |
| 8 Leonis | 6½ | 1.92 | 2.8 | 16 59.7 | 22 23.7 | +10 9.8 | +1.3298 | .5669 | .2308 | +90 | +48 |
| | | | | | | | | | | | |
| 34 Leonis | 6 | +1.85 | −4.9 | +13 57.8 | **9** 13 34.6 | + 0 48.4 | +0.7091 | .5462 | −.2531 | +90 | − 3 |
| 37 Leonis | 6 | 1.85 | 5.3 | 14 20.6 | 15 50.7 | + 2 59.7 | −0.2520 | .5451 | .2558 | +32 | −53 |
| ι Leonis | 5 | 1.76 | 7.1 | 11 11.9 | **10** 6 56.2 | − 6 24.9 | −1.0366 | .5321 | .2652 | −12 | −79 |
| χ Leonis | 5 | 1.68 | 7.5 | 8 0.2 | 14 30.2 | + 0 54.5 | +0.1650 | .9270 | .2745 | +54 | −35 |
| σ Leonis | 4 | 1.63 | 8.3 | 6 42.4 | 22 19.8 | + 8 29.2 | −0.6683 | .5229 | .2780 | +11 | −84 |
| 89 Leonis | 6 | 1.56 | 8.6 | 3 44.8 | **11** 4 53.0 | − 9 9.8 | +0.5549 | .5182 | .2795 | +78 | −16 |
| | | | | | | | | | | | |
| β Virginis | 3½ | +1.50 | −9.1 | + 2 27.6 | 13 0.0 | − 1 17.7 | −0.3857 | .5142 | −.2800 | +25 | −66 |
| B. A. C. 4043 | 6½ | 1.45 | 9.2 | + 1 13.1 | 17 17.0 | + 2 51.6 | −0.2954 | .5124 | .2797 | +30 | −61 |
| B. A. C. 4200 | 6½ | 1.33 | 9.3 | − 3 55.9 | **12** 8 1.4 | − 6 50.3 | +0.9899 | .5077 | .2758 | +86 | + 8 |
| B. A. C. 4225 | 6½ | 1.30 | 9.4 | 4 22.2 | 9 58.4 | − 6 56.8 | +0.9160 | .5073 | 2750 | +86 | + 3 |
| f Virginis | 6 | 1.28 | 9.3 | 5 9.1 | 12 38.0 | − 2 21.9 | +1.0097 | .5064 | .2736 | +85 | + 9 |
| B. A. C. 4255 | 6½ | 1.28 | 9.8 | 3 41.6 | 13 38.3 | − 1 23.4 | −0.8020 | .5067 | .2732 | + 3 | −90 |
| | | | | | | | | | | | |
| B. A. C. 4294 | 6½ | +1.23 | −9.6 | − 5 37.5 | 18 12.2 | + 3 2.4 | −0.0063 | .5060 | −.2706 | +44 | −45 |
| B. A. C. 4394 | 6 | 1.13 | 9.6 | 8 19.3 | **13** 5 5.4 | −10 23.5 | −0.0551 | .5051 | .2630 | +40 | −48 |
| 50 Virginis | 6 | 1.12 | 9.2 | 9 40.2 | 5 42.7 | − 9 47.3 | +1.2151 | .5051 | .2626 | +81 | +24 |
| 58 Virginis | 6 | 1.10 | 9.4 | 9 53.8 | 9 42.8 | − 5 54.3 | +0.4132 | .5051 | .2593 | +65 | −24 |
| α Virginis | 1 | 1.06 | 9.5 | 10 31.0 | 13 43.1 | − 2 1.0 | +0.0446 | .5054 | .2556 | +44 | −43 |
| B. A. C. 4531 | 6 | 1.00 | 9.1 | 12 34.8 | 18 36.9 | + 2 44.2 | +1.0148 | .5058 | .2508 | +78 | +10 |
| | | | | | | | | | | | |
| 86 Virginis | 6 | +0.97 | −9.7 | −11 48.4 | **14** 0 26.2 | + 8 23.2 | −1.2583 | .5065 | −.2446 | −33 | −90 |
| B. A. C. 4679 | 6½ | 0.87 | 9.1 | 14 22.6 | 9 55.0 | − 6 24.9 | −0.7619 | .5083 | .2334 | 0 | −90 |
| B. A. C. 4700 | 5½ | 0.84 | 9.1 | 15 43.1 | 13 9.2 | − 3 16.5 | −0.0614 | .5090 | .2294 | +36 | −48 |
| B. A. C. 4923 | 6 | 0.63 | 8.2 | 20 51.3 | **15** 12 24.6 | − 4 43.3 | +0.5598 | .5122 | .2222 | +65 | −14 |
| B. A. C. 5023 | 6 | 0.53 | 8.2 | 21 56.5 | 21 45.1 | + 4 19.7 | +0.0239 | .5202 | .1788 | +33 | −43 |
| 42 Libræ | 5½ | 0.41 | 8.0 | 23 24.9 | **16** 9 15.4 | − 8 21.9 | −0.2912 | .5251 | .1570 | +16 | −63 |
| | | | | | | | | | | | |
| B. A. C. 5197 | 6 | +0.40 | −7.7 | −24 19.5 | 11 53.5 | − 5 58.9 | +0.3038 | .5262 | −.1518 | +45 | −28 |
| b Scorpii | 5 | 0.36 | 7.4 | 25 22.5 | 14 18.4 | − 3 38.6 | +1.0988 | .5273 | .1470 | +65 | +22 |
| A² Scorpii | 5 | 0.36 | 7.6 | 24 57.4 | 15 33.9 | − 2 25.6 | +0.4559 | .5278 | .1443 | +53 | −20 |
| B. A. C. 5253 | 6 | 0.36 | 7.8 | 24 9.8 | 15 43.0 | − 2 16.8 | −0.4401 | .5279 | .1439 | + 6 | −73 |
| B. A. C. 5254 | 6 | 0.36 | 8.0 | 23 36.5 | 15 44.8 | − 2 15.1 | −1.0573 | .5279 | .1439 | −30 | −90 |
| B. A. C. 5255 | 6 | 0.36 | 7.6 | 25 2.6 | 15 50.6 | − 2 9.5 | +0.5098 | .5279 | .1437 | +56 | −17 |
| | | | | | | | | | | | |
| 3 Scorpii | 6 | +0.35 | −7.6 | −24 52.7 | 16 3.7 | − 1 56.7 | +0.2976 | .5280 | −.1433 | +44 | −28 |
| B. A. C. 5286 | 6½ | 0.34 | 7.9 | 24 29.0 | 17 55.4 | − 0 8.7 | −0.4026 | .5288 | .1394 | + 7 | −71 |
| π Scorpii | 3 | 0.33 | 7.4 | 25 45.5 | 18 1.1 | − 0 3.2 | +0.9904 | .5289 | .1392 | +64 | +14 |
| B. A. C. 5314 | 6 | 0.31 | 7.4 | 25 31.3 | 20 8.7 | + 2 0.3 | +0.4384 | .5297 | .1348 | +51 | −21 |
| B. A. C. 5347 | 5 | 0.30 | 7.4 | 25 59.7 | 22 21.9 | + 4 9.2 | +0.6683 | .5307 | .1301 | +64 | − 7 |
| σ Scorpii | 3½ | 0.25 | 7.8 | 25 17.7 | **17** 4 28.8 | +10 4.0 | −0.8606 | .5332 | .1169 | −20 | −90 |
| | | | | | | | | | | | |
| α Scorpii | 1½ | +0.21 | −7.7 | −26 9.4 | 8 15.8 | −10 16.5 | −0.3343 | .5348 | −.1084 | + 8 | −66 |
| B. A. C. 5603 | 6½ | +0.14 | 7.2 | 28 16.7 | 15 22.4 | − 3 24.1 | +1.2999 | .5373 | .0920 | +62 | +60 |
| 43 Ophiuchi | 6 | −0.02 | 7.7 | 28 1.3 | **18** 8 44.9 | −10 37.2 | −0.2212 | .5430 | .0499 | + 8 | −58 |
| 3 Sagittarii | 5 | 0.09 | 8.0 | 27 47.0 | 19 34.5 | − 0 9.9 | −0.8782 | .5452 | .0223 | −30 | −90 |
| B. A. C. 6063 | 6½ | 0.13 | 8.0 | 28 2.8 | 23 38.7 | + 3 45.8 | −0.6570 | .5458 | .0122 | −19 | −90 |
| B. A. C. 6062 | 6½ | 0.14 | 7.8 | 28 44.5 | **19** 0 29.3 | + 4 34.6 | +0.1025 | .5459 | .0101 | +20 | −39 |
| | | | | | | | | | | | |
| γ Sagittarii | 4 | −0.15 | −7.5 | −29 35.2 | 3 18.1 | + 7 17.6 | +1.0200 | .5463 | −.0030 | +61 | +19 |
| B. A. C. 6120 | 6½ | 0.17 | 7.9 | 28 22.3 | 4 6.9 | + 8 4.7 | −0.3259 | .5463 | −.0006 | − 2 | −65 |
| B. A. C. 6127 | 5 | 0.17 | 7.9 | 28 28.2 | 4 41.3 | + 8 37.9 | −0.2164 | .5463 | +.0007 | + 3 | −58 |
| B. A. C. 6190 | 6½ | 0.21 | 7.9 | 28 41.5 | 8 49.4 | −11 22.6 | +0.0538 | .5466 | .0111 | +18 | −42 |
| B. A. C. 6191 | 6½ | 0.20 | 7.9 | 28 19.6 | 8 49.8 | −11 22.2 | −0.3507 | .5466 | .0114 | − 3 | −67 |
| B. A. C. 6220 | 6½ | −0.22 | −8.0 | −28 29.4 | 10 52.5 | − 9 23.9 | +0.1419 | .5467 | +.0167 | + 8 | +53 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### FEBRUARY.

| STAR'S— | | | | | AT CONJUNCTION IN R. A. | | | | | LIMITING PARALLELS. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | $Y$ | $x'$ | $y'$ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| τ Sagittarii | 3½ | −0.34 | − 8.3 | −27 51.1 | **20** 6 54.5 | + 9 56.4 | +0.0038 | .5456 | +.0678 | +21 | −44 |
| B. A. C. 6628 | 6 | 0.38 | 8.3 | 28 6.2 | 14 46.7 | − 6 27.7 | +0.8949 | .5442 | .0874 | +62 | + 8 |
| B. A. C. 6666 | 6 | 0.39 | 8.5 | 27 14.5 | 17 12.9 | − 4 6.5 | +0.1638 | .5437 | .0937 | +31 | −35 |
| ω Sagittarii | 5 | 0.45 | 8.6 | 26 37.7 | **21** 5 0.8 | + 7 17.3 | +0.7594 | .5405 | .1213 | +64 | − 1 |
| A Sagittarii | 5 | 0.45 | 8.6 | 26 31.9 | 6 27.1 | + 8 40.6 | +0.8299 | .5398 | .1248 | +64 | + 3 |
| B. A. C. 7049 | 6 | 0.52 | 9.3 | 22 48.2 | 20 40.5 | − 1 34.4 | −1.2448 | .5353 | .1561 | −46 | −90 |
| 17 Capricorni | 6 | −0.55 | − 9.3 | −21 57.9 | **22** 4 30.8 | + 6 0.4 | −0.8674 | .5322 | +.1723 | −14 | −90 |
| B. A. C. 7197 | 6 | 0.54 | 9.0 | 23 11.5 | 5 31.5 | + 6 59.2 | +0.6405 | .5318 | .1743 | +65 | −10 |
| η Capricorni | 5½ | 0.57 | 9.2 | 20 20.8 | 13 13.7 | − 9 33.6 | −1 0498 | .5288 | .1889 | −24 | −90 |
| χ Capricorni | 6 | 0.56 | 9.1 | 21 41.5 | 15 11.6 | − 7 39.5 | +0.7840 | .5281 | .1924 | +69 | − 2 |
| 27 Capricorni | 6 | 0.56 | 9.2 | 21 3.3 | 15 40.5 | − 7 11.6 | +0.1858 | .5279 | .1932 | +43 | −35 |
| φ Capricorni | 5½ | 0.57 | 9.0 | 21 20.0 | 18 36.8 | − 4 20.9 | +1.0617 | .5267 | .1994 | +69 | +17 |
| γ Capricorni | 3½ | −0.60 | − 9.2 | −17 13.4 | **23** 6 35.7 | + 7 15.3 | −0.8774 | .5220 | +.2180 | − 9 | −90 |
| δ Capricorni | 3 | 0.60 | 9.1 | 10 41.5 | 10 1.5 | +10 34.7 | −0.6926 | .5207 | .2231 | + 2 | −90 |
| B. A. C. 8365 | 6½ | 0.61 | 4.2 | − 1 11.6 | **26** 8 32.0 | + 6 58.3 | +1.1655 | .5103 | .2810 | +89 | +20 |
| B. A. C. 57 | 6½ | 0.61 | 3.5 | + 0 59.9 | 15 2.0 | −10 43.3 | +0.6898 | .5115 | .2815 | +90 | − 9 |
| 60 Piscium | 6 | 0.58 | 1.3 | 6 3.8 | **27** 5 59.3 | + 3 46.8 | −0.4221 | .5159 | .2765 | +23 | −68 |
| 62 Piscium | 6 | 0.59 | 1.1 | 6 37.4 | 6 25.7 | + 4 12.5 | −0.8812 | .5161 | .2764 | − 1 | −84 |
| B. A. C. 221 | 6 | −0.56 | − 1.6 | + 4 38.5 | 6 26.1 | + 4 12.8 | +1.1790 | .5161 | +.2764 | +90 | +22 |
| δ Piscium | 4½ | 0.59 | 1.0 | 6 54.6 | 6 37.5 | + 4 23.9 | −1.1243 | .5161 | .2763 | −17 | −83 |
| ε Piscium | 4 | 0.53 | − 0.3 | 7 13.3 | 13 43.4 | +11 16.7 | +0.5019 | .5191 | .2730 | +75 | −18 |
| π Piscium | 6 | 0.47 | + 2.3 | 11 30.5 | **28** 6 16.6 | + 3 18.6 | +0.4942 | .5277 | .2607 | +75 | −16 |
| 27 Arietis | 6 | 0.27 | 5.8 | 17 9.4 | **29** 7 2.5 | + 3 15.1 | +0.7838 | .5446 | .2293 | +90 | + 4 |
| B. A. C. 782 | 6½ | 0.27 | 6.4 | 18 20.1 | 8 13.5 | + 4 23.6 | −0.1531 | .5458 | .2274 | +37 | −44 |
| μ Arietis | 5½ | −0.25 | + 7.0 | +19 29.0 | 12 4.6 | + 8 6.6 | −0.4664 | .5488 | +.2209 | +20 | −60 |
| 47 Arietis | 6 | 0.16 | 7.8 | 20 10.3 | 18 53.4 | − 9 19.1 | +0.2938 | .5545 | .2085 | +62 | −19 |
| ε Arietis, *mult.* | 4½ | −0.16 | + 8.0 | +20 50.7 | 19 22.6 | − 8 50.9 | −0.2933 | .5549 | +.2076 | +29 | −49 |
| **MARCH.** | | | | | | | | | | | |
| ζ Arietis | 4½ | −0.05 | + 8.4 | +20 35.2 | **1** 2 3.3 | − 2 24.8 | +1.3122 | .5606 | +.1989 | +90 | +51 |
| 66 Arietis | 6½ | +0.01 | 9.5 | 22 22.7 | 7 40.5 | + 2 59.9 | +0.5396 | .5653 | .1816 | +80 | − 4 |
| 7 Tauri, *mult.* | 6 | 0.04 | 10.2 | 24 3.0 | 10 7.1 | + 5 21.0 | −0.7264 | .5673 | .1758 | + 5 | −66 |
| 9 Tauri | 6 | 0.06 | 9.8 | 22 48.1 | 11 10.7 | + 6 22.2 | +0.7291 | .5682 | .1734 | +90 | + 7 |
| 11 Tauri | 6 | 0.07 | 10.7 | 24 55.3 | 12 41.5 | + 7 49.5 | −1.1781 | .5692 | .1695 | −30 | −65 |
| *g* Pleiadum | 5½ | 0.10 | 10.3 | 23 54.0 | 14 21.2 | + 9 25.5 | +0.1487 | .5709 | .1656 | +54 | −22 |
| *b* Pleiadum | 4 | 0.11 | 10.2 | 23 43.5 | 14 23.2 | + 9 27.4 | +0.3328 | .5709 | .1656 | +65 | −13 |
| *m* Pleiadum | 7 | +0.10 | +10.5 | +24 27.1 | 14 29.2 | + 9 33.1 | −0.3899 | .5710 | +.1654 | +24 | −50 |
| *e* Pleiadum | 5 | 0.10 | 10.4 | 24 4.8 | 14 30.8 | + 9 34.7 | −0.0067 | .5711 | .1654 | +44 | −29 |
| *c* Pleiadum | 5 | 0.12 | 10.4 | 23 58.9 | 14 46.0 | + 9 49.3 | +0.1345 | .5712 | .1646 | +53 | −22 |
| *d* Pleiadum | 5 | 0.12 | 10.2 | 23 33.8 | 14 58.7 | +10 1.5 | +0.5947 | .5713 | .1641 | +86 | + 1 |
| η Tauri | 3 | 0.14 | 10.3 | 23 43.4 | 15 26.7 | +10 28.5 | +0.5090 | .5717 | .1630 | +78 | − 3 |
| *f* Pleiadum | 4 | 0.14 | 10.2 | 23 40.5 | 16 7.3 | +11 7.5 | +0.6670 | .5723 | .1612 | +90 | + 5 |
| *h* Pleiadum | 5½ | +0.14 | +10.3 | +23 45.6 | 16 7.9 | +11 8.1 | +0.5832 | .5723 | +.1611 | +85 | + 1 |
| B. A. C. 1192 | 6½ | 0.13 | 10.9 | 25 12.3 | 16 33.5 | +11 32.7 | −0.8192 | .2726 | .1602 | − 1 | −65 |
| *p* Tauri | 6 | 0.28 | 11.2 | 26 9.6 | **2** 0 43.8 | − 4 36.0 | −0.5660 | .5788 | .1386 | +13 | −57 |
| φ Tauri, *mult.* | 5 | 0.33 | 11.8 | 27 3.4 | 4 26.9 | − 1 1.7 | −0.9799 | .5816 | .1283 | −13 | −63 |
| $\chi^1$ Tauri | 5½ | 0.35 | 11.2 | 25 20.3 | 5 21.2 | − 0 9.6 | −0.8800 | .5822 | .1257 | +90 | +21 |
| $\chi^2$ Tauri | 8½ | 0.35 | 11.2 | 25 20.5 | 5 21.4 | − 0 9.5 | −0.8758 | .5822 | .1257 | +90 | +21 |
| B. A. C. 1648 | 6½ | +0.78 | +12.1 | +27 49.9 | **3** 3 35.0 | − 2 50.5 | +0.4022 | .5946 | +.0576 | +71 | + 1 |
| B. A. C. 1649 | 6½ | 0.79 | 12.6 | 29 26.6 | 3 37.6 | − 2 47.8 | −1.2263 | .5946 | .0572 | −41 | −61 |
| β Tauri | 2 | 0.82 | 12.3 | 28 30.1 | 5 33.0 | − 0 57.3 | −0.1709 | .5954 | .0509 | +35 | −28 |
| B. A. C. 1709 | 6 | 0.87 | 12.4 | 29 5.3 | 6 48.0 | + 0 14.6 | −0.7018 | .5958 | .0469 | + 4 | −60 |
| B. A. C. 1746 | 6½ | 0.91 | 11.8 | 27 35·0 | 9 0.0 | + 2 20.6 | +0.9230 | .5965 | .0390 | +90 | +32 |
| B. A. C. 1772 | 6 | +0.94 | +12.3 | +29 8.7 | 11 23.3 | + 4 41.0 | −0.6107 | .5971 | +0.318 | +10 | −53 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### MARCH.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. $\Delta\alpha$ | Red'ns from 1876.0. $\Delta\delta$ | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | $Y$ | $x'$ | $y'$ | N'n. | S'n. |
| | | s | " | ° ′ | d h m | h m | | | | ° | ° |
| 136 Tauri | 5 | +1.03 | +11.4 | +27 35.0 | 3 15 37.8 | + 8 42.0 | +1.1041 | .5978 | +.0173 | +90 | +46 |
| B. A. C. 1882 | 6½ | 1.06 | 11.9 | 28 55.4 | 16 47.8 | + 9 49.1 | −0.2328 | .5981 | +.0134 | +32 | −28 |
| κ Aurigæ | 4½ | 1.21 | 11.5 | 29 32.7 | 23 45.3 | − 7 31.0 | −0.8496 | .5986 | −.0103 | − 5 | −61 |
| B. A. C 2097 | 6½ | 1.29 | 10.6 | 28 17.6 | 4 5 20.0 | − 2 10.5 | +0.3039 | .5983 | .0292 | +64 | − 1 |
| 49 Aurigæ | 5½ | 1.32 | 10.2 | 28 7.2 | 7 7.9 | − 0 27.1 | +0.4221 | .5981 | .0353 | +73 | + 4 |
| 53 Aurigæ | 6 | 1.37 | 10.5 | 29 5.4 | 8 17.4 | + 0 39.5 | −0.6013 | .5979 | .0390 | +10 | −52 |
| 54 Aurigæ | 6 | +1.36 | +10.2 | +28 22.4 | 8 44.5 | + 1 5.4 | −0.1050 | .5978 | −.0407 | +51 | −12 |
| 28 Geminor. | 6 | 1.40 | 10.2 | 29 5.8 | 10 39.7 | + 2 55.8 | −0.7101 | .5974 | .0471 | + 4 | −60 |
| 47 Geminor. | 6 | 1.55 | 8.5 | 27 3.7 | 20 40.1 | −11 29.0 | +0.7092 | .5944 | .0799 | +90 | +16 |
| 53 Geminor. | 6 | 1.60 | 8.4 | 28 6.8 | 22 22.0 | − 9 51.3 | −0.4940 | .5939 | .0854 | +17 | −48 |
| 59 Geminor. | 6½ | 1.64 | 8.0 | 27 52.7 | 5 1 37.6 | − 6 43.9 | −0.5511 | .5922 | .0958 | +14 | −53 |
| ι Geminorum | 4 | 1.65 | 8.0 | 28 2.7 | 2 4.5 | − 6 18.1 | −0.7630 | .5920 | .0971 | + 1 | −62 |
| $b^1$ Geminorum | 5½ | +1.68 | + 7.9 | +28 22.5 | 3 26.2 | − 4 59.7 | −1.2311 | .5913 | −.1014 | −40 | −62 |
| $b^2$ Geminorum | 5½ | 1.68 | 7.9 | 28 10.4 | 3 37.3 | − 4 49.0 | −1.0459 | .5912 | .1020 | −19 | −62 |
| B. A. C. 2472 | 6 | 1.69 | 7.9 | 28 10.5 | 3 56.7 | − 4 30.5 | −1.0814 | .5906 | .1030 | −22 | −62 |
| υ Geminorum | 4½ | 1.71 | 7.3 | 27 10.3 | 5 58.3 | − 2 33.9 | −0.2835 | .5900 | .1092 | +29 | −38 |
| c Geminorum | 4½ | 1.74 | 6.4 | 26 4.8 | 9 8.4 | + 0 28.5 | +0.4585 | .5882 | .1188 | +75 | − 1 |
| φ Geminorum | 5 | 1.81 | 6.1 | 27 5.2 | 12 44.7 | + 3 56.0 | −1.0065 | .5861 | .1295 | −15 | −63 |
| $\omega^1$ Cancri | 6 | +1.82 | + 5.4 | +25 43.9 | 15 39.9 | + 6 44.1 | −0.0288 | .5843 | −.1378 | +43 | −28 |
| $\omega^2$ Cancri | 6½ | 1.80 | 5.4 | 25 25.8 | 15 59.0 | + 7 2.5 | +0.2329 | .5842 | .1383 | +59 | −15 |
| $\psi^1$ Cancri | 6½ | 1.87 | 5.0 | 26 12.6 | 19 18.1 | +10 13.6 | −1.0311 | .5819 | .1479 | −17 | −64 |
| $\psi^2$ Cancri | 4 | 1.87 | 5.0 | 25 53.0 | 19 24.3 | +10 19.6 | −0.7173 | .5819 | .1482 | + 5 | −65 |
| λ Cancri | 6 | 1.88 | 3.9 | 24 24.7 | 23 25.5 | − 9 48.8 | +0.1525 | .5789 | .1592 | +54 | −21 |
| $\upsilon^1$ Cancri, *mult.* | 7 | 1.93 | 3.7 | 24 56.3 | 6 1 52.0 | − 7 28.0 | −0.7766 | .5770 | .1654 | + 1 | −65 |
| $\upsilon^2$ Cancri | 6½ | +1.92 | + 3.5 | +24 33.3 | 2 39.4 | − 6 42.4 | −0.5370 | .5764 | −.1675 | +16 | −58 |
| $\upsilon^3$ Cancri | 6 | 1.93 | 3.3 | 24 29.8 | 3 49.6 | − 5 34.9 | −0.6596 | .5755 | .1707 | + 8 | −64 |
| 32 Cancri | 6 | 1.95 | 3.1 | 24 30.3 | 4 25.6 | − 5 0.3 | −0.7700 | .5750 | .1722 | + 2 | −64 |
| γ Cancri | 4½ | 1.93 | + 1.9 | 21 54.8 | 8 39.3 | − 0 56.3 | +1.1023 | .5717 | .1824 | +90 | +31 |
| B. A. C. 3138 | 6 | 2.04 | 0.0 | 21 47.6 | 21 17.0 | +11 13.0 | −1.2586 | .5614 | .2101 | −35 | −68 |
| 8 Leonis | 6½ | 1.99 | − 2.7 | 16 59.7 | 7 7 26.5 | − 2 59.4 | +1.3820 | .5530 | .2289 | +90 | +62 |
| 34 Leonis | 6 | +2.03 | − 5.3 | +13 57.8 | 22 57.2 | +11 59.0 | +0.7338 | .5502 | −.2520 | +90 | − 2 |
| 37 Leonis | 6 | 2.04 | 5.6 | 14 20.6 | 20 42.2 | + 9 48.5 | −0.2400 | .5393 | .2538 | +32 | −53 |
| l Leonis | 5 | 2.02 | 8.0 | 11 11.9 | 8 16 35.5 | + 5 2.4 | −1.0488 | .5290 | .2697 | −12 | −79 |
| χ Leonis | 5 | 1.98 | 9.0 | 8 0.2 | 9 0 14.5 | −11 33.2 | +0.1526 | .5245 | .2747 | +53 | −35 |
| σ Leonis | 4 | 1.98 | 9.9 | 6 42.3 | 8 8.0 | − 3 54.5 | −0.6945 | .5205 | .2783 | + 9 | −84 |
| 89 Leonis | 6 | 1.94 | 10.7 | 3 44.7 | 14 43.2 | + 2 28.5 | +0.5254 | .5175 | .2803 | +76 | −18 |
| β Virginis | 3½ | +1.90 | −11.4 | + 2 27.6 | 22 51.4 | +10 21.8 | −0.4265 | .5145 | −.2813 | +23 | −69 |
| B. A. C. 4043 | 6½ | 1.88 | 11.8 | + 1 13.1 | 10 3 8.4 | − 9 28.9 | −0.3396 | .5133 | .2813 | +28 | −64 |
| B. A. C. 4200 | 6½ | 1.81 | 12.7 | − 3 55.9 | 17 50.1 | + 4 46.4 | +0.9300 | .5101 | .2779 | + 4 | +86 |
| B. A. C. 4225 | 6½ | 1.80 | 12.8 | 4 22.3 | 19 46.3 | + 6 39.0 | +0.8545 | .5099 | .2771 | − 1 | +86 |
| f Virginis | 6 | 1.79 | 12.9 | 5 9.2 | 22 24.9 | + 9 13.0 | +0.9456 | .5096 | .2760 | + 5 | +85 |
| B. A. C. 4255 | 6½ | 1.79 | 13.1 | 3 41.6 | 23 24.9 | +10 11.1 | −0.8644 | .5095 | .2755 | −90 | 0 |
| B. A. C. 4294 | 6½ | +1.76 | −13.3 | − 5 37.6 | 11 3 56.6 | − 9 25.2 | −0.0733 | .5092 | −.2730 | −49 | +40 |
| B. A. C. 4394 | 6 | 1.71 | 13.5 | 8 19.4 | 14 43.3 | + 1 2.5 | −0.1302 | .5092 | .2658 | −52 | +36 |
| 50 Virginis | 6 | 1.71 | 13.4 | 9 40.3 | 15 20.2 | + 1 38.2 | +1.1361 | .5092 | .2653 | +18 | +81 |
| 58 Virginis | 6 | 1.69 | 13.5 | 9 53.8 | 19 17.4 | + 5 28.4 | +0.3346 | .5093 | .2621 | −28 | +61 |
| α Virginis | 1 | 1.67 | 13.6 | 10 31.1 | 23 14.9 | + 9 18.8 | −0.0360 | .5097 | .2584 | −47 | +40 |
| i Virginis | 5 | 1.66 | 13.3 | 12 3.9 | 12 0 1.4 | +10 3.9 | +1.4119 | .5097 | .2577 | +52 | +78 |
| B. A. C. 4531 | 6 | +1.65 | −13.4 | −12 34.9 | 4 4.5 | −10 0.2 | +0.9270 | .5103 | −.2537 | + 5 | +78 |
| 86 Virginis | 6 | 1.63 | 13.6 | 11 48.5 | 9 49.2 | − 4 25.8 | −1.3381 | .5112 | .2474 | −90 | −41 |
| B. A. C. 4679 | 6½ | 1.58 | 13.2 | 14 22.7 | 19 9.6 | + 4 37.7 | −0.8480 | .5133 | .2361 | −90 | − 5 |
| B. A. C. 4700 | 5½ | 1.55 | 13.3 | 15 43.2 | 22 20.9 | + 7 43.2 | −0.1520 | .5141 | .2320 | −53 | +31 |
| B. A. C. 4923 | 6 | 1.43 | 12.3 | 20 51.4 | 13 21 14.6 | + 5 54.6 | +0.4805 | .5214 | .1968 | −18 | +60 |
| B. A. C. 5023 | 6 | +1.37 | −11.9 | −21 56.6 | 14 6 26.8 | − 9 10.7 | −0.0724 | .5248 | −.1803 | −49 | +29 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### MARCH.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle *H* | *Y* | *x′* | *y′* | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| 42 Libræ | 5½ | +1.31 | −11.4 | −23 25.0 | **14** 17 47.5 | + 1 48.1 | −0.3856 | .5293 | −.1582 | −69 | +10 |
| B. A. C. 5197 | 6 | 1.30 | 11.1 | 24 19.6 | 20 23.6 | + 4 90 0 | +0.2070 | .5303 | .1529 | +40 | −34 |
| *b* Scorpii | 5 | 1.28 | 10.8 | 25 22.5 | 22 46.7 | + 6 37.5 | +0.9984 | .5308 | .1479 | +65 | +13 |
| A² Scorp., *mult* | 5 | 1.27 | 10.8 | 24 57.5 | **15** 0 1.3 | + 7 49.6 | +0.3588 | .5317 | .1452 | +47 | −25 |
| B. A. C. 5253 | 6 | 1.26 | 11.2 | 24 9.9 | 0 10.3 | + 7 58.4 | −0.5335 | .5317 | .1450 | + 1 | −81 |
| B. A. C. 5254 | 6 | 1.26 | 11.3 | 23 36.5 | 0 16.8 | + 8 4·7 | −1.1596 | .5318 | .1448 | −38 | −90 |
| B. A. C. 5255 | 6 | +1.26 | −10.8 | −25 2.6 | 0 17.8 | + 8 5.6 | +0.4124 | .5318 | −.1448 | +50 | −22 |
| 3 Scorpii | 6 | 1.26 | 10.9 | 24 52.7 | 0 30.7 | + 8 18.1 | +0.2010 | .5318 | .1443 | +39 | −34 |
| 4 Scorpii | 6 | 1.27 | 10.6 | 25 54.2 | 0 52.0 | + 8 38.7 | +1.2712 | .5318 | .1435 | +64 | +43 |
| B. A. C. 5286 | 6½ | 1.25 | 11.1 | 24 29.0 | 2 21.1 | +10 4.8 | −0.4951 | .5323 | .1403 | + 2 | −78 |
| π Scorpii | 3 | 1.25 | 10.6 | 25 45.5 | 2 26.9 | +10 10.5 | +0.8910 | .5324 | .1401 | +64 | + 6 |
| B. A. C. 5314 | 6 | 1.23 | 10.6 | 25 31.3 | 4 32.9 | −11 47.7 | +0.3420 | .5331 | .1356 | +45 | −26 |
| B. A. C. 5347 | 5 | +1.22 | −10.4 | −25 59.8 | 6 44.6 | − 9 40.4 | +0.5711 | .5339 | −.1308 | +58 | −13 |
| σ Scorpii | 3½ | 1.18 | 10.5 | 25 17.8 | 12 47.8 | − 3 49.2 | −0.9510 | .5359 | .1174 | −26 | −90 |
| α Scorpii | 1½ | 1.18 | 10.1 | 26 9.5 | 16 32.7 | − 0 11.8 | −0.4260 | .5373 | .1088 | + 3 | −73 |
| τ Scorpii | 3½ | 1.13 | 9.5 | 27 57.5 | 19 27.3 | + 2 36.9 | +1.2529 | .5382 | .1020 | +62 | +43 |
| B. A. C. 5603 | 6½ | 1.10 | 9.2 | 28 16.7 | 23 35.7 | + 6 36.9 | +1.2045 | .5395 | .0923 | +62 | +36 |
| 43 Ophiuchi | 6 | 0.95 | 8.9 | 28 1.3 | **16** 16 52.6 | − 0 41.7 | −0.3077 | .5433 | .0497 | + 3 | −64 |
| 3 Sagittarii | 5 | +0.85 | − 8.5 | −27 47.0 | **17** 3 40.7 | + 9 44.0 | −0.9605 | .5449 | −.0224 | −35 | −90 |
| B. A. C. 6063 | 6½ | 0.82 | 8.3 | 28 2.8 | 7 44.6 | −10 20.6 | −0.7387 | .5452 | .0118 | −23 | −90 |
| B. A. C. 6072 | 6½ | 0.83 | 8.0 | 28 44.5 | 8 35.2 | − 9 31.8 | +0.0202 | .5452 | .0097 | +16 | −44 |
| γ¹ Sagittarii | 4 | 0.80 | 7.5 | 29 35.2 | 11 24.1 | − 6 48.7 | +0.9380 | .5453 | .0025 | +61 | +12 |
| B. A. C. 6120 | 6½ | 0.79 | 7.9 | 28 22.3 | 12 12.9 | − 6 1.6 | −0.4066 | .5453 | −.0002 | − 7 | −71 |
| B. A. C. 6127 | 5 | 0.78 | 7.8 | 28 28.2 | 12 47.3 | − 5 28.3 | −0.2970 | .5453 | +.0010 | − 1 | −63 |
| B. A. C. 6190 | 6½ | +0.74 | − 7.6 | −28 41.5 | 16 55.5 | − 1 28.8 | −0.0253 | .5452 | +.0118 | +14 | −46 |
| B. A. C. 6191 | 6½ | 0.74 | 7.7 | 28 19.6 | 16 55.9 | − 1 28.4 | −0.4297 | .5452 | .0119 | − 7 | −73 |
| B. A. C. 6220 | 6½ | 0.74 | 7.6 | 28 29.4 | 18 59.0 | + 0 30.3 | −0.2204 | .5451 | .0170 | + 4 | −58 |
| τ Sagittarii | 3½ | 0.54 | 7.0 | 27 51.1 | **18** 15 5.3 | − 4 5.1 | −0.0668 | .5430 | .0680 | +17 | −49 |
| B. A. C. 6628 | 6 | 0.48 | 6.5 | 28 6.3 | 23 0.3 | + 3 33.7 | +0.8285 | .5414 | .0874 | +62 | + 4 |
| B. A. C. 6666 | 6 | 0.44 | 6.7 | 27 14.4 | **19** 1 27.4 | + 5 55.8 | +0.0974 | .5406 | .0934 | +28 | −39 |
| ω Sagittarii | 5 | +0.34 | − 6.2 | −26 37.7 | 13 20.0 | − 6 35.7 | +0.6990 | .5371 | +.1212 | +64 | − 5 |
| A Sagittarii | 5 | 0.33 | 6.2 | 26 31.9 | 14 46.9 | − 5 11.7 | +0.7704 | .5367 | .1244 | +64 | − 1 |
| B. A. C. 7049 | 6 | 0.18 | 6.8 | 22 48.2 | **20** 5 6.3 | + 8 39.2 | −1.3002 | .5317 | .1556 | −54 | −90 |
| 17 Capricorni | 6 | 0.11 | 6.5 | 21 57.9 | 12 59.8 | − 7 42.8 | −0.9181 | .5290 | .1716 | −17 | −90 |
| B. A. C. 7197 | 6 | 0.12 | 6.0 | 23 11.4 | 14 0.9 | − 6 43.7 | +0.5916 | .5286 | .1738 | +63 | −12 |
| η Capricorni | 5½ | 0.04 | 6.5 | 20 20.7 | 21 45.8 | + 0 46.4 | −1.0957 | .5259 | .1883 | −27 | −90 |
| χ Capricorni | 6 | +0.04 | − 6.1 | −21 41.5 | 23 44.4 | + 2 41.1 | +0.7405 | .5252 | +.1919 | +68 | − 5 |
| 27 Capricorni | 6 | 0.03 | 6.3 | 21 3.2 | **21** 0 13.5 | + 3 9.3 | +0.1417 | .5250 | .1929 | +41 | −37 |
| φ Capricorni | 5½ | +0.01 | 6.0 | 21 9.9 | 3 10.8 | + 6 1.0 | +0.8395 | .5241 | .1980 | +69 | + 1 |
| γ Capricorni | 3½ | −0.09 | 6.3 | 17 13.4 | 15 12.5 | − 6 20.0 | −0.9133 | .5199 | .2176 | −11 | −90 |
| δ Capricorni | 3 | 0.12 | 6.3 | 16 41.4 | 18 38.9 | − 3 0.0 | −0.7263 | .5189 | .2231 | 0 | −90 |
| ι Aquarii | 4 | 0.19 | 6.1 | 14 28.3 | **22** 4 21.7 | + 6 24.9 | −0.8666 | .5162 | .2367 | − 6 | −90 |
| 42 Aquarii | 6 | −0.23 | − 6.0 | −13 27.0 | 9 35.0 | +11 28.5 | −0.7031 | .5150 | +.2430 | + 4 | −90 |
| 45 Aquarii | 6 | 0.23 | 5.8 | 13 55.5 | 10 41.4 | −11 27.1 | +0.0745 | .5148 | .2447 | +44 | −41 |
| 50 Aquarii | 6 | 0.23 | 5.6 | 14 9.5 | 13 26.0 | − 8 47.5 | +0.9991 | .5141 | .2480 | −76 | + 9 |
| SATURN | | | | 11 50.0 | 14 44.7 | − 7 31.1 | −1.1505 | .5098 | .2481 | −23 | −90 |
| B. A. C. 7835 | 3½ | 0.25 | 5.6 | 13 33.0 | 16 51.1 | − 6 3.5 | +1.0527 | .5136 | .2512 | +77 | +13 |
| σ Aquarii | 4½ | 0.27 | 5.9 | 11 18.8 | 16 36.0 | − 5 43.2 | −1.2385 | .5136 | .2515 | −30 | −90 |
| 58 Aquarii | 6 | −0.28 | − 5.9 | −11 32.5 | 17 7.2 | − 5 12.9 | −0.8638 | .5135 | +.2522 | − 4 | −90 |
| 64 Aquarii | 6½ | 0.30 | 5.8 | 10 40.4 | 20 59.0 | − 1 28.1 | −0.8020 | .5129 | .2562 | 0 | −90 |
| 70 Aquarii | 6 | 0.31 | 5.4 | 11 12.7 | 1 40.2 | + 3 4.5 | +0.9788 | .5122 | .2608 | +79 | + 8 |
| 81 Aquarii | 6 | 0.38 | 5.4 | 7 43.6 | **23** 8 16.2 | + 9 28.7 | −0.9618 | .5117 | .2665 | − 8 | −90 |
| 82 Aquarii | 6 | 0.38 | 5.4 | 7 14.4 | 8 51.4 | +10 2.8 | −1.3183 | .5117 | .2670 | −36 | −90 |
| *k*¹ Aquarii | 6 | −0.37 | − 5.2 | − 8 21.8 | 10 10.8 | +11 19.8 | +0.2203 | .5117 | +.2680 | +55 | −33 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### MARCH.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. $\Delta\alpha$ | $\Delta\delta$ | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | $Y$ | $x'$ | $y'$ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| $h^2$ Aquarii | 7 | −0.37 | − 5.2 | − 8 25.4 | **23** 10 15.8 | +11 24.6 | +0.3061 | .5117 | +.2681 | +60 | −29 |
| $h^3$ Aquarii | 7 | 0.36 | 5.1 | 8 36.4 | 10 33.0 | +11 41.4 | +0.5756 | .5117 | .2683 | +76 | −16 |
| $h^4$ Aquarii | 7½ | 0.38 | 5.1 | 8 21.7 | 11 13.7 | −11 39.2 | +0.5005 | .5117 | .2688 | +72 | −20 |
| φ Aquarii | 4½ | 0.40 | 5.0 | 6 43.1 | 14 52.2 | − 8 7.2 | −0.2452 | .5116 | .2714 | +31 | −58 |
| 96 Aquarii | 5½ | 0.42 | 5.0 | 5 48.2 | 17 27.3 | − 5 36.8 | −0.5028 | .5117 | .2731 | +18 | −75 |
| B. A. C. 8134 | 6½ | 0.42 | − 4.9 | − 5 21.1 | 18 28.4 | − 4 37.5 | −0.6973 | .5117 | .2738 | + 9 | −90 |
| π Piscium | 6 | −0.59 | + 1.3 | +11 30.5 | **26** 13 28.3 | −11 42.0 | +0.4990 | .5348 | +.2645 | +75 | −16 |
| 27 Arietis | 6 | 0.52 | 4.5 | 17 9.4 | **27** 13 37.6 | +11 37.7 | +0.7872 | .5526 | .2323 | +90 | + 4 |
| B. A. C. 782 | 6½ | 0.53 | 4.8 | 18 20.0 | 14 46.9 | −11 15.5 | −0.1396 | .5535 | .2306 | +37 | −44 |
| *u* Arietis | 5½ | 0.51 | 5.3 | 19 29.0 | 18 32.6 | − 7 37.9 | −0.4492 | .5566 | .2239 | +21 | −59 |
| 47 Arietis | 6 | 0.46 | 6.2 | 20 10.3 | **28** 1 11.8 | − 1 13.2 | +0.3032 | .5620 | .2113 | +63 | −19 |
| ε Arietis, *mult* | 4½ | 0.46 | 6.4 | 20 50.7 | 1 40.4 | − 0 45.6 | −0.2778 | .5624 | .2103 | +30 | −48 |
| ζ Arietis | 4½ | −0.38 | + 7.0 | +20 35.1 | 8 12.1 | + 5 31.5 | +1.3134 | .5677 | +.1966 | +90 | +51 |
| 66 Arietis | 6½ | 0.34 | 7.9 | 22 22.7 | 13 43.3 | +10 49.2 | +0.5469 | .5722 | .1838 | +81 | − 4 |
| 7 Tauri | 6 | 0.34 | 8.4 | 24 2.9 | 16 5.9 | −10 52.7 | −0.7086 | .5740 | 1781 | + 6 | −66 |
| 9 Tauri | 6 | 0.30 | 8.3 | 22 48.1 | 17 8.2 | − 9 52.8 | +0.7348 | .5748 | .1751 | +90 | + 8 |
| 11 Tauri | 6 | 0.31 | 9.0 | 24 55.7 | 18 37.3 | − 8 27.2 | −1.1564 | .5759 | .1715 | −27 | −65 |
| *g* Pleiadum | 5½ | 0.27 | 8.7 | 23 54.0 | 20 15.0 | − 6 53.3 | +0.1588 | .5770 | .1676 | +54 | −21 |
| *b* Pleiadum | 4 | −0.26 | + 8.7 | +23 43.5 | 20 17.0 | − 6 51.4 | +0.3416 | .5770 | +.1676 | +66 | −12 |
| *m* Pleiadum | 7 | 0.28 | 8.9 | 24 27.0 | 20 22.9 | − 6 45.8 | −0.3744 | .5771 | .1672 | +24 | −49 |
| *e* Pleiadum | 5 | 0.28 | 8.8 | 24 4.7 | 20 24.4 | − 6 44.3 | +0.0047 | .5771 | .1672 | +45 | −29 |
| *c* Pleiadum | 5 | 0.27 | 8.8 | 23 58.9 | 20 39.3 | − 6 29.9 | +0.1618 | .5773 | .1664 | +54 | −21 |
| *d* Pleiadum | 5 | 0.25 | 8.7 | 23 33.8 | 20 51.8 | − 6 18.0 | +0.6017 | .5774 | .1659 | +87 | + 1 |
| η Tauri | 3 | 0.25 | 8.7 | 23 43.4 | 21 19.2 | − 5 51.6 | +0.5159 | .5778 | .1646 | +79 | − 3 |
| *f* Pleiadum | 4 | −0.25 | + 8.9 | +23 40.5 | 21 59.2 | − 5 13.2 | +0.6733 | .5782 | +.1631 | +90 | + 5 |
| *h* Pleiadum | 5½ | 0.25 | 8.9 | 23 45.5 | 21 59.7 | − 5 12.7 | +0.5898 | .5782 | .1631 | +86 | + 2 |
| B. A. C. 1192 | 6½ | 0.26 | 9.4 | 25 12.3 | 22 24.9 | − 4 48.5 | −0.8013 | .5785 | .1618 | 0 | −65 |
| *p* Tauri | 6 | 0.14 | 10.0 | 26 9.6 | **29** 6 26.7 | + 2 54.2 | −0.5518 | .5843 | .1398 | +14 | −56 |
| φ Tauri, *mult.* | 5 | 0.09 | 10.5 | 27 3.4 | 10 6.4 | + 6 25.1 | −0.9636 | .5864 | .1296 | −12 | −63 |
| $\chi^1$ Tauri | 5½ | 0.07 | 10.0 | 25 20.2 | 10 59.9 | + 7 16.5 | +0.8851 | .5870 | .1270 | +90 | +21 |
| $\chi^2$ Tauri | 8½ | −0.07 | +10.0 | +25 20.5 | 11 0.2 | + 7 16.8 | +0.8806 | .5870 | +.1270 | +90 | +21 |
| B. A. C. 1648 | 6½ | +0.32 | 11.5 | 27 49.9 | **30** 8 59.7 | + 4 21.6 | +0.4091 | .5968 | .0576 | +71 | + 2 |
| B. A. C. 1649 | 6½ | 0.31 | 12.0 | 29 26.6 | 9 2.2 | + 4 24.0 | +1.2145 | .5968 | .0576 | −39 | −61 |
| β Tauri | 2 | 0.34 | 11.7 | 28 30.2 | 10 57.0 | + 6 14.0 | −0.1627 | .5972 | .0509 | +35 | −27 |
| B. A. C. 1709 | 6½ | 0.37 | 11.8 | 29 5.3 | 12 11.5 | + 7 25.3 | −0.6925 | .5975 | .0469 | + 5 | −59 |
| B. A. C. 1746 | 6½ | 0.42 | 11.4 | 27 35.0 | 14 32.9 | + 9 40.7 | +0.9287 | .5978 | .0389 | +90 | +32 |
| B. A. C. 1772 | 6 | +0.44 | +11.9 | +29 8.7 | 15 45.8 | +10 50.6 | −0.6039 | .5980 | +.0349 | +10 | −52 |
| 136 Tauri | 5 | 0.53 | 11.3 | 27 35.0 | 20 59.6 | − 8 8.7 | +1.1097 | .5985 | .0173 | +90 | +46 |
| B. A. C. 1882 | 6½ | 0.57 | 11.7 | 28 55.4 | 22 9.6 | − 7 1.8 | −0.2261 | .5988 | +.0133 | +32 | −27 |
| κ Aurigæ | 4½ | 0.71 | 11.6 | 29 32.7 | **31** 5 7.2 | − 0 21.8 | −0.8443 | .5980 | −.0105 | − 5 | −61 |
| B. A. C. 2097 | 6½ | 0.81 | 10.9 | 28 17.6 | 10 42.9 | + 4 59.7 | +0.3092 | .5968 | .0298 | +64 | − 1 |
| 49 Aurigæ | 5½ | 0.84 | 10.7 | 28 7.2 | 12 31.2 | + 6 43.5 | +0.4274 | .5963 | .0358 | +73 | + 5 |
| 53 Aurigæ | 6 | +0.87 | +11.0 | +29 5.4 | 13 41.1 | + 7 50.5 | −0.5984 | .5962 | −.0394 | +11 | −52 |
| 54 Aurigæ | 6 | 0.88 | 10.8 | 28 22.4 | 14 8.3 | + 8 16.6 | +0.1096 | .5961 | .0411 | +51 | −12 |
| 28 Geminor. | 6 | +0.92 | +10.8 | +29 5.8 | 16 4.2 | +10 7.6 | −0.7079 | .5955 | −.0471 | + 4 | −60 |

### APRIL.

| Name. | Mag. | $\Delta\alpha$ | $\Delta\delta$ | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | $Y$ | $x'$ | $y'$ | N'n. | S'n. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 Geminor. | 6 | +1.08 | + 9.4 | +27 3.7 | **1** 2 9.5 | − 4 12.3 | +0.7154 | .5910 | −.0796 | +90 | +16 |
| 53 Geminor. | 6 | 1.13 | 9.7 | 28 6.8 | 3 52.5 | − 2 33.5 | −0.4935 | .5901 | .0849 | +17 | −49 |
| 59 Geminor. | 6½ | 1.19 | 9.3 | 27 52.7 | 7 10.3 | + 0 36.1 | −0.5514 | .5882 | .0951 | +14 | −53 |
| ι Geminorum | 4 | 1.21 | 9.2 | 28 2.7 | 7 37.6 | + 1 2.4 | −0.7647 | .5879 | .0966 | + 1 | −62 |
| $b^1$ Geminorum | 5½ | 1.24 | 9.2 | 28 22.5 | 9 0.3 | + 2 21.7 | −1.2359 | .5872 | .1006 | −41 | −62 |
| $b^2$ Geminorum | 5½ | 1.24 | 9.0 | 28 10.4 | 9 11.5 | + 2 32.5 | −1.0498 | .5870 | .1012 | −20 | −62 |
| B. A. C. 2472 | 6 | +1.25 | + 9.0 | +28 10.5 | 9 31.1 | + 2 51.2 | −1.0854 | .5868 | −.1024 | −23 | −62 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### APRIL.

| Star's— Name. | Star's— Mag. | Star's— Red'ns from 1876.0. Δα | Star's— Red'ns from 1876.0. Δδ | Star's— Apparent Declination. | At Conjunction in R. A. Washington Mean Time. | | At Conjunction in R. A. Hour Angle H | At Conjunction in R. A. Y | At Conjunction in R. A. x′ | At Conjunction in R. A. y′ | Limiting Parallels. N'n. | Limiting Parallels. S'n. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | s | ″ | ° ′ | d | h m | h m | | | | ° | ° |
| υ Geminorum | 4½ | +1.27 | + 8.5 | +27 10.3 | 1 | 11 34.6 | + 4 49.7 | −0.2836 | .5856 | −.1084 | +29 | −38 |
| c Geminorum | 4½ | 1.31 | 7.8 | 26 4.8 | | 14 47.2 | + 7 54.6 | +0.4625 | .5835 | .1178 | +75 | − 1 |
| φ Geminorum | 5 | 1.38 | 7.7 | 27 5.2 | | 18 26.8 | +11 25.5 | −1.0123 | .5809 | .1284 | −16 | −63 |
| ω¹ Cancri | 6 | 1.41 | 6.8 | 25 44.0 | | 21 24.9 | − 9 43.5 | −0.0285 | .5787 | .1367 | +43 | −28 |
| ω² Cancri | 6½ | 1.42 | 6.8 | 25 25.8 | | 21 44.5 | − 9 24.6 | +0.2348 | .5785 | .1375 | +59 | −15 |
| ψ¹ Cancri | 6½ | 1.48 | 6.6 | 26 12.6 | 2 | 1 6.8 | − 6 10.2 | −1.0382 | .5759 | .1467 | −17 | −64 |
| ψ² Cancri | 4 | +1.48 | + 6.5 | +25 53.1 | | 1 13.1 | − 6 4.2 | −0.7223 | .5758 | −.1470 | + 5 | −65 |
| λ Cancri | 6 | 1.51 | 5.4 | 24 24.7 | | 5 18.8 | − 2 8.0 | +0.1535 | .5726 | .1574 | +53 | −21 |
| υ¹ Cancri, *mult* | 7 | 1.57 | 5.4 | 24 56.4 | | 7 48.1 | + 0 15.6 | −0.7834 | .5706 | .1636 | + 1 | −65 |
| υ² Cancri | 6½ | 1.56 | 5.0 | 24 33.4 | | 8 36.4 | + 1 2.0 | −0.5252 | .5699 | .1656 | +16 | −57 |
| υ³ Cancri | 6 | 1.59 | 4.9 | 24 29.9 | | 9 48.0 | + 2 11.0 | −0.6656 | .5690 | .1686 | + 8 | −65 |
| 32 Cancri | 6 | 1.59 | 4.7 | 24 30.3 | | 10 24.8 | + 2 46.3 | −0.7768 | .5685 | .1700 | + 1 | −66 |
| γ Cancri | 4½ | +1.59 | + 3.3 | +21 54.9 | | 14 43.7 | + 6 55.6 | +1.1115 | .5647 | −.1803 | +90 | +31 |
| B. A. C. 3138 | 6 | 1.77 | + 1.5 | 21 47.6 | 3 | 3 38.4 | − 4 38.1 | −1.2717 | .5540 | .2051 | −36 | −68 |
| 34 Leonis | 6 | 1.89 | − 4.4 | 13 57.9 | 4 | 5 56.3 | − 3 14.3 | +0.7389 | .5335 | .2484 | +90 | − 2 |
| 37 Leonis | 6 | 1.91 | 4.5 | 14 20.7 | | 8 18.5 | − 0 56.8 | −0.2451 | .5319 | .2511 | +32 | −53 |
| *i* Leonis | 5 | 1.97 | 7.3 | 11 11.9 | 5 | 0 0.2 | − 9 45.3 | −1.0612 | .5221 | .2669 | −13 | −79 |
| χ Leonis | 5 | 1.97 | 8.9 | 8 0.2 | | 7 49.7 | − 2 10.4 | +0.1530 | .5182 | .2713 | +53 | −35 |
| σ Leonis | 4 | +1.99 | − 9.9 | + 6 42.3 | | 15 53.3 | + 5 38.4 | −0.7008 | .5147 | −.2752 | + 9 | −84 |
| 89 Leonis | 6 | 1.98 | 11.1 | 3 44.7 | | 22 36.5 | −11 50.5 | +0.5320 | .5123 | .2773 | +77 | −17 |
| β Virginis | 3½ | 2.00 | 12.1 | 2 27.6 | 6 | 6 53.6 | − 3 48.2 | −0.4265 | .5100 | .2786 | +23 | −69 |
| B. A. C. 4043 | 6½ | 2.00 | 12.7 | + 1 13.0 | | 11 14.9 | + 0 25.4 | −0.3382 | .5090 | .2786 | +27 | −64 |
| B. A. C. 4200 | 6½ | 2.01 | 14.2 | − 3 56.0 | 7 | 2 9.0 | − 9 6.9 | +0.9443 | .5072 | .2761 | +86 | + 5 |
| B. A. C. 4225 | 6½ | 2.01 | 14.3 | 4 22.3 | | 4 6.7 | − 7 12.7 | +0.8680 | .5071 | .2754 | +86 | 0 |
| *f* Virginis | 6 | +2.00 | −14.6 | − 5 9.2 | | 6 47.0 | − 4 37.0 | +0.9601 | .5071 | −.2743 | +85 | + 6 |
| B. A. C. 4255 | 6½ | 2.02 | 14.6 | 3 41.6 | | 7 47.6 | − 3 38.3 | −0.8594 | .5071 | .2743 | 0 | −90 |
| B. A. C. 4294 | 6½ | 2.02 | 14.9 | 5 37.6 | | 12 22.0 | + 0 48.1 | −0.0623 | .5072 | .2718 | +41 | −48 |
| B. A. C. 4394 | 6 | 2.02 | 15.6 | 8 19.5 | | 23 13.8 | +11 20.7 | −0.1158 | .5081 | .2648 | +37 | −51 |
| 50 Virginis | 6 | 2.02 | 15.6 | 9 40.3 | | 23 50.8 | +11 56.6 | +1.1556 | .5082 | .2644 | −81 | +20 |
| 53 Virginis | 6 | 2.02 | 15.8 | 9 53.9 | 8 | 3 49.4 | − 8 11.8 | +0.3520 | .5089 | .2612 | +62 | −27 |
| α Virginis | 1 | +2.03 | −16.0 | −10 31.1 | | 7 47.8 | − 4 20.5 | −0.0179 | .5096 | −.2579 | +41 | −46 |
| B. A. C. 4531 | 6 | 2.02 | 16.1 | 12 35.0 | | 12 38.6 | + 0 21.7 | +0.9502 | .5106 | .2533 | +78 | + 6 |
| 86 Virginis | 6 | 2.03 | 16.2 | 12 48.5 | | 18 23.6 | + 5 56.4 | −1.3189 | .5120 | .2474 | −40 | −90 |
| B. A. C. 4679 | 6½ | 2.03 | 16.3 | 14 22.7 | 9 | 3 43.9 | − 9 0.1 | −0.8226 | .5147 | .2362 | − 4 | −90 |
| B. A. C. 4700 | 5½ | 2.02 | 16.1 | 15 43.2 | | 6 55.0 | − 5 54.8 | −0.1247 | .5157 | .2322 | +32 | −52 |
| B. A. C. 4923 | 6 | 2.03 | 15.2 | 20 51.5 | 10 | 5 43.5 | − 7 48.8 | +0.5174 | .5244 | .1973 | +62 | −17 |
| B. A. C. 5023 | 6 | +2.03 | −14.9 | −21 56.6 | | 14 52.4 | + 1 2.7 | −0.0314 | .5280 | −.1809 | +31 | −46 |
| 42 Libræ | 5½ | 2.01 | 14.1 | 23 25.0 | 11 | 2 8.7 | +11 57.1 | −0.3397 | .5328 | .1587 | +12 | −65 |
| B. A. C. 5197 | 6 | 2.01 | 13.8 | 24 19.6 | | 4 43.6 | − 9 33.1 | +0.2532 | .5337 | .1533 | +42 | −31 |
| *b* Scorpii | 5 | 2.01 | 13.6 | 25 22.6 | | 7 5.7 | − 7 15.7 | +1.0447 | .5346 | .1485 | +65 | +17 |
| A² Scorp., *mult.* | 5 | 2.00 | 13.5 | 24 57.5 | | 8 19.8 | − 6 4.0 | +0.4062 | .5351 | .1457 | +59 | −23 |
| B. A. C. 5253 | 6 | 2.00 | 13.6 | 24 9.9 | | 8 28.8 | − 5 55.3 | −0.4852 | .5351 | .1455 | + 4 | −76 |
| B. A. C. 5254 | 6 | +1.99 | −13.8 | −23 36.6 | | 8 30.6 | − 5 53.6 | −1.0972 | .5351 | −.1453 | −34 | −90 |
| B. A. C. 5255 | 6 | 2.00 | 13.5 | 25 2.6 | | 8 36.2 | − 5 48.2 | +0.4596 | .5351 | .1454 | +5[illegible] | −20 |
| 3 Scorpii | 6 | 2.00 | 13.5 | 24 52.8 | | 8 49.0 | − 5 35.8 | +0.2488 | .5352 | .1447 | +41 | −31 |
| 4 Scorpii | 6 | 2.01 | 13.3 | 25 54.2 | | 9 11.2 | − 5 14.2 | +1.3180 | .5354 | .1440 | +64 | +60 |
| B. A. C. 5286 | 6½ | 1.99 | 13.5 | 24 28.5 | | 10 38.6 | − 3 49.8 | −0.4558 | .5359 | .1407 | + 5 | −74 |
| π Scorpii | 3 | 2.01 | 13.2 | 25 45.5 | | 10 44.3 | − 3 44.3 | +0.9389 | .5359 | .1405 | +64 | +10 |
| B. A. C. 5314 | 6 | +2.00 | −13.1 | −25 31.4 | | 12 49.5 | − 1 43.2 | +0.3912 | .5367 | −.1359 | +48 | −23 |
| B. A. C. 5347 | 5 | 2.01 | 12.8 | 25 59.8 | | 15 0.4 | + 0 23.3 | +0.6207 | .5373 | .1313 | +60 | −10 |
| σ Scorpii | 3½ | 1.98 | 12.7 | 25 17.8 | | 21 1.1 | + 6 11.9 | −0.8974 | .5392 | .1175 | −22 | −90 |
| α Scorpii | 1½ | 1.97 | 12.3 | 26 9.5 | 12 | 0 44.5 | + 9 47.8 | −0.3716 | .5403 | .1088 | + 6 | −68 |
| B. A. C. 5603 | 6½ | 1.96 | 11.1 | 28 16.8 | | 7 45.0 | − 7 26.1 | +1.2598 | .5422 | .0922 | +62 | +46 |
| 43 Ophiuchi | 6 | +1.86 | − 9.8 | −28 1.4 | 13 | 0 56.8 | + 9 10.3 | −0.2443 | .5455 | −.0342 | + 6 | −60 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### APRIL.

| STAR'S— Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | AT CONJUNCTION IN R. A. Washington Mean Time. | Hour Angle H | Y | x′ | y′ | Limiting Parallels. N'n. | S'n. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| 3 Sagittarii | 5 | +1.78 | -9.0 | -27 47.0 | **13** 11 43.4 | - 4 25.5 | -0.8954 | .5462 | -.0220 | -31 | -90 |
| B. A. C. 6063 | 6½ | 1.75 | 8.4 | 28 2.2 | 15 47.0 | - 0 30.4 | -0.6724 | .5462 | .0116 | -19 | -90 |
| B. A. C. 6072 | 6½ | 1.76 | 8.2 | 28 44.5 | 16 37.5 | + 0 18.4 | +0.0871 | .5462 | .0094 | +19 | -40 |
| γ¹ Sagittarii | 4 | 1.76 | 7.7 | 29 35 1 | 19 26.2 | + 3 1.2 | +1.0055 | .5461 | .0021 | +61 | +17 |
| B. A. C. 6120 | 6½ | 1.73 | 8.0 | 28 22.3 | 20 15.1 | + 3 48.3 | -0.3390 | .5460 | -.0001 | - 3 | -66 |
| B. A. C. 6127 | 5 | 1.72 | 7.9 | 28 28.3 | 20 49.6 | + 4 21.6 | -0.2286 | .5460 | +.0014 | + 3 | -59 |
| B. A. C. 6190 | 6½ | +1.70 | -7.5 | -28 41.5 | **14** 0 57.8 | + 8 21.2 | +0.0438 | .5457 | +.0121 | +17 | -42 |
| B. A. C. 6191 | 6½ | 1.69 | 7.6 | 28 19.6 | 0 58.2 | + 8 21.6 | -0.3615 | .5457 | .0121 | - 3 | -68 |
| B A. C. 6220 | 6½ | 1.70 | 7.4 | 28 29.3 | 3 1.4 | +10 20.5 | -0.1513 | .5455 | .0175 | + 8 | -54 |
| τ Sagittarii | 3½ | 1.49 | 5.5 | 27 51.1 | 23 12.0 | + 5 49.4 | +0.0074 | .5416 | .0680 | +21 | -44 |
| B. A. C. 6628 | 6 | 1.41 | 4.5 | 28 6.2 | **15** 7 10.1 | -10 28.8 | +0.9059 | .5392 | .0728 | +62 | + 9 |
| B. A. C. 6666 | 6 | 1.37 | 4.6 | 27 14.3 | 9 38.3 | - 8 5.6 | +0.1732 | .5384 | .0933 | +32 | -35 |
| ω Sagittarii | 5 | +1.25 | -3.7 | -26 37.6 | 21 37.1 | + 3 29.2 | +0.7795 | .5342 | +.1207 | +64 | 0 |
| A Sagittarii | 5 | 1.24 | 3.6 | 26 31.8 | 23 7.0 | + 4 56.2 | +0.8509 | .5337 | .1241 | +64 | + 4 |
| B. A. C. 7049 | 6 | 1.04 | 3.5 | 22 48.1 | **16** 13 34.2 | - 5 5.1 | -1.2266 | .5279 | .1545 | -43 | -90 |
| 17 Capricorni | 6 | 0.94 | 3.2 | 21 57.9 | 21 34.8 | + 2 40.0 | -0.8435 | .5247 | .1703 | -13 | -90 |
| B. A. C. 7197 | 6 | 0.94 | 2.6 | 23 11.3 | 22 35.8 | + 3 39.1 | +0.6724 | .5243 | .1721 | +66 | - 8 |
| η Capricorni | 5½ | 0.83 | 3.1 | 20 20.7 | **17** 6 27.1 | +11 15.4 | -1.0231 | .5213 | .1866 | +22 | -90 |
| χ Capricorni | 6 | +0.82 | -2.5 | -21 41.5 | 8 27.5 | -10 48.0 | +0.8222 | .5205 | +.1901 | +69 | 0 |
| 27 Capricorni | 6 | 0.81 | 2.6 | 21 3.2 | 8 57.0 | -10 19.4 | +0.2210 | .5203 | .1909 | +45 | -33 |
| φ Capricorni | 5½ | 0.79 | 2.3 | 21 9.9 | 11 56.7 | - 7 25.3 | +0.9217 | .5192 | .1961 | +69 | + 7 |
| γ Capricorni | 3½ | 0.63 | 2.6 | 17 13.3 | **18** 0 9.0 | + 4 24.5 | -0.8418 | .5151 | .2156 | - 7 | -90 |
| δ Capricorni | 3 | 0.58 | 2.4 | 16 41.4 | 3 38.4 | + 7 47.5 | -0.6548 | .5141 | .2207 | + 4 | -90 |
| ι Aquarii | 4 | 0.48 | 2.3 | 14 28.3 | 13 29.6 | - 6 39.2 | -0.7987 | .5116 | .2342 | - 2 | -90 |
| 42 Aquarii | 6 | +0.41 | -2 2 | -13 27.0 | 18 47.0 | - 1 31.5 | -0.6353 | .5105 | +.2409 | + 8 | -87 |
| 45 Aquarii | 6 | 0.41 | 1.9 | 13 55.5 | 19 54.3 | - 0 26.2 | +0.1448 | .5103 | .2422 | +48 | -37 |
| 50 Aquarii | 6 | 0.39 | 1.5 | 14 9.5 | 22 41.1 | + 1 15.6 | +1.0703 | .5099 | .2456 | +76 | +14 |
| B. A. C. 7835 | 6½ | 0.35 | 1.5 | 13 33.0 | **19** 1 32.2 | + 5 1.6 | +1 1233 | .5093 | .2488 | +77 | +18 |
| σ Aquarii | 4½ | 0.33 | 2.1 | 11 18.7 | 1 53.5 | + 5 22.2 | -1.1768 | .5093 | .2491 | -25 | -90 |
| 58 Aquarii | 6 | 0.32 | 2.1 | 11 32.4 | 2 25.1 | + 5 52.9 | -0.8011 | .5092 | .2498 | 0 | -90 |
| SATURN | | | | -10 53.9 | 5 23.1 | + 8 45.6 | -0.7393 | .5054 | +.2515 | + 4 | -90 |
| 64 Aquarii | 6½ | +0.29 | -2.0 | 10 40.4 | 6 19.7 | + 9 38.6 | -0.7406 | .5088 | .2538 | + 4 | -90 |
| 70 Aquarii | 6 | 0.25 | 1.4 | 11 12.6 | 11 4.0 | - 9 43.6 | +1.0440 | .5085 | .2584 | +79 | +12 |
| 81 Aquarii | 6 | 0.16 | 1.9 | 7 43.7 | 17 44 0 | - 3 15.5 | -0.9045 | .5084 | .2642 | - 4 | -90 |
| 82 Aquarii | 6 | 0.15 | 1.9 | 7 14.4 | 18 19.7 | - 2 40.8 | -1.2627 | .5084 | .2647 | -30 | -90 |
| h¹ Aquarii | 5½ | 0.16 | 1.5 | 8 21.8 | 19 39.6 | - 1 23.3 | +0.2789 | .5084 | .2657 | +58 | -30 |
| h² Aquarii | 7 | +0.16 | -1.5 | - 8 25.3 | 19 44.8 | - 1 18.3 | +0.3642 | .5084 | +.2658 | +63 | -26 |
| h³ Aquarii | 7 | 0.16 | 1.5 | 8 36.3 | 20 2.2 | - 1 1.3 | +0.6343 | .5084 | .2661 | +80 | -12 |
| h⁴ Aquarii | 7½ | 0.15 | 1.4 | 8 21.7 | 20 43.3 | - 0 21.5 | +0.5587 | .5084 | .2666 | +76 | -16 |
| φ Aquarii | 4½ | 0.10 | 1.7 | 6 43.1 | **20** 0 23.5 | + 3 12.2 | -0.1912 | .5085 | .2693 | +34 | -55 |
| 96 Aquarii | 5½ | 0.07 | 1.7 | 5 48.1 | 2 59.7 | + 5 43.7 | -0.4510 | .5089 | .2710 | +21 | -71 |
| B. A. C. 8134 | 6½ | 0.07 | 1.8 | 5 21.1 | 4 1.3 | + 6 43.5 | -0.6464 | .5090 | .2717 | +11 | -86 |
| B. A. C. 8184 | 5½ | +0.03 | -1.4 | - 5 12.5 | 8 12.3 | +10 47.2 | +0.3463 | .5096 | +.2741 | +63 | -27 |
| 20 Piscium | 6 | -0.05 | 0.9 | 3 27.1 | 17 37.7 | - 4 4.4 | +1.1102 | .5115 | .2785 | +87 | +15 |
| B. A. C. 8311 | 6½ | 0.09 | 1.2 | 0 34.9 | 21 6.8 | - 0 41.6 | -0.9059 | .5124 | .2796 | - 3 | -90 |
| B. A. C. 8365 | 6½ | 0.12 | 0.6 | - 1 11.5 | **21** 2 18.8 | + 4 20.9 | +1.1844 | .5140 | .2809 | +89 | +21 |
| B. A. C. 57 | 6½ | 0.19 | 0.6 | + 0 59.9 | 7 41.9 | + 9 32.2 | +0.7114 | .5160 | .2817 | +90 | - 8 |
| 60 Piscium | 6 | 0.30 | -0.1 | 6 3.8 | 23 17.3 | + 0 40.5 | -0.3977 | .5236 | .2798 | +24 | -66 |
| 62 Piscium | 6 | -0.30 | 0.0 | + 6 37.4 | 23 42.9 | + 1 5.3 | -0.8515 | .5238 | +.2797 | 0 | -84 |
| B. A. C. 221 | 6 | 0.29 | +0.3 | 4 38.5 | 23 43.3 | + 1 5.7 | +1.1798 | .5238 | .2797 | +90 | +22 |
| δ Piscium | 4½ | 0.31 | -0.1 | 6 54.6 | 23 54.3 | + 1 16.4 | -1.0917 | .5239 | .2796 | -16 | -83 |
| 11 Tauri | 6 | 0.43 | +7.3 | 24 55.7 | **25** 2 38.4 | + 1 21.7 | -1.2070 | .5854 | .1735 | -32 | -65 |
| g Pleiadum | 5½ | 0.40 | 7.3 | 23 54.0 | 4 13.4 | + 2 52.9 | +0.0896 | .5865 | .1692 | +50 | -25 |
| b Pleiadum | 4 | -0.40 | +7.3 | +23 43.5 | 4 15.3 | + 2 54.7 | +0.2697 | .5865 | +.1691 | +61 | -16 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### APRIL.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| *m* Pleiadum | 7 | −0.40 | + 7.4 | +24 27.0 | **25** 4 21.1 | + 3 0 3 | −0.4365 | .5865 | +.1689 | +21 | −52 |
| *e* Pleiadum | 5 | 0.40 | 7.4 | 24 4.7 | 4 22.6 | + 3 1.8 | −0.0630 | .5866 | .1689 | +41 | −32 |
| *c* Pleiadum | 5 | 0.39 | 7.4 | 23 58.8 | 4 37.0 | + 3 15.6 | +0.0754 | .5869 | .1681 | +49 | −25 |
| *d* Pleiadum | 5 | 0.39 | 7.3 | 23 33.8 | 4 49.1 | + 3 27.1 | +0.5258 | .5871 | .1675 | +80 | − 2 |
| η Tauri | 3 | 0.39 | 7.4 | 23 43.3 | 5 15.7 | + 3 52.7 | +0.4415 | .5873 | .1665 | +73 | − 7 |
| *f* Pleiadum | 4 | 0.38 | 7.4 | 23 40.5 | 5 54.5 | + 4 29.9 | +0.5951 | .5878 | .1649 | +86 | + 1 |
| *k* Pleiadum | 5½ | −0.38 | + 7.5 | +23 45.5 | 5 55.0 | + 4 30.4 | +0.5130 | .5878 | +.1649 | +79 | − 3 |
| B. A. C. 1192 | 6½ | 0.40 | 7.6 | 25 12.3 | 6 19.5 | + 4 53.9 | −0.8608 | .5882 | .1635 | − 4 | −65 |
| *p* Tauri | 6 | 0.35 | 8.6 | 26 9.5 | 14 7.2 | −11 37.5 | −0.6200 | .5942 | .1412 | +10 | −60 |
| φ Tauri, *mult.* | 5 | 0.31 | 8.9 | 27 3.3 | 17 40.5 | − 8 13.0 | −1.0287 | .5964 | .1307 | −17 | −63 |
| $\chi^1$ Tauri | 5½ | 0.28 | 8.7 | 25 20.2 | 18 32.4 | − 7 23.3 | +0.7929 | .5970 | .1279 | +90 | +16 |
| $\chi^2$ Tauri | 8½ | 0.28 | 8.7 | 25 20.5 | 18 32.6 | − 7 23.1 | +0.7889 | .5970 | .1279 | +90 | +16 |
| B. A. C. 1648 | 6½ | −0.02 | +10.2 | +27 49.9 | **26** 15 53.8 | −10 56.7 | +0.3072 | .6065 | +.0581 | +64 | − 3 |
| β Tauri | 2 | +0.01 | 10.5 | 28 30.2 | 17 47.8 | − 9 7.6 | −0.2580 | .6068 | .0512 | +30 | −32 |
| B. A. C. 1709 | 6½ | 0.02 | 10.6 | 29 5.6 | 19 0.3 | − 7 58.2 | −0.7818 | .6070 | .0471 | 0 | −61 |
| B. A. C. 1746 | 6½ | 0.06 | 10.3 | 27 35.0 | 21 17.7 | − 5 46.7 | +0.8168 | .6073 | .0391 | +90 | +25 |
| B. A. C. 1772 | 6 | 0.08 | 10.8 | 29 8.7 | 22 28.7 | − 4 38.8 | −0.6964 | .6074 | .0348 | + 5 | −59 |
| 136 Tauri | 5 | 0.15 | 10.4 | 27 35.0 | **27** 3 34.2 | + 0 13.4 | +0.9917 | .6075 | .0173 | +90 | +38 |
| B. A. C. 1882 | 6½ | +0.18 | +10.9 | +28 55.4 | 4 42.3 | + 1 18.5 | −0.3283 | .6074 | +.0129 | +26 | −33 |
| κ Aurigæ | 4½ | 0.30 | 11.0 | 29 32.7 | 11 29.5 | + 7 48.0 | −0.9436 | 6064 | −.0109 | −12 | −61 |
| B. A. C. 2097 | 6½ | 0.39 | 10.5 | 28 17.8 | 16 57.2 | −10 58.5 | +0.1939 | .6047 | .0301 | +56 | − 7 |
| 49 Aurigæ | 5½ | 0.42 | 10.4 | 28 7.2 | 18 43.1 | − 9 17.1 | +0.3100 | .6040 | .0363 | +64 | − 2 |
| 53 Aurigæ | 6 | 0.44 | 10.6 | 29 5.5 | 19 51.5 | − 8 11.6 | −0.7060 | .6036 | .0400 | + 4 | −60 |
| 54 Aurigæ | 6 | 0.45 | 10.5 | 28 22.4 | 20 18.1 | − 7 46.2 | −0.0054 | .6034 | .0414 | +44 | −18 |
| 28 Geminor. | 6 | +0.48 | +10.5 | +29 5.8 | 22 11.4 | − 5 57.8 | −0.8153 | .6025 | −.0480 | − 3 | −61 |
| 47 Geminor. | 6 | 0.66 | 9.4 | 27 3.7 | **28** 8 4.7 | + 3 30.4 | +0.5887 | .5971 | .0807 | +87 | + 9 |
| 53 Geminor. | 6 | 0.70 | 9.6 | 28 6.8 | 9 45.9 | + 5 7.3 | −0.6095 | .5960 | .0861 | +10 | −56 |
| 59 Geminor. | 6½ | 0.75 | 9.4 | 27 52.7 | 13 0.3 | + 8 13.6 | −0.6690 | .5937 | .0962 | + 7 | −60 |
| ι Geminor. | 4 | 0.76 | 9.4 | 28 2.7 | 13 27.1 | + 8 39.4 | −0.8802 | .5933 | .0978 | − 7 | −62 |
| $b^2$ Geminor. | 5 | 0.79 | 9.3 | 28 10.3 | 14 59.5 | +10 7.9 | −1.1633 | .5922 | .1024 | −31 | −62 |
| B. A. C. 2472 | 6 | +0.79 | + 9.2 | +28 10.5 | 15 18.8 | +10 26.4 | −1.1998 | .5920 | −.1033 | −35 | −62 |
| υ Geminor. | 4½ | 0.82 | 8.9 | 27 10.3 | 17 20.5 | −11 36.9 | −0.4049 | .5904 | .1097 | +22 | −45 |
| *c* Geminor. | 6 | 0.87 | 8.2 | 26 4.8 | 20 30.1 | − 8 35.1 | +0.3340 | .5879 | .1190 | +65 | − 8 |
| φ Geminor. | 5 | 0.94 | 8.4 | 27 5.2 | **29** 0 6.8 | − 5 7.2 | −1.1314 | .5849 | .1295 | −26 | −63 |
| $\omega^1$ Cancri | 6 | 0.96 | 7.7 | 25 44.0 | 3 2.7 | − 2 18.3 | −0.1553 | .5823 | .1376 | +36 | −34 |
| $\omega^2$ Cancri | 6½ | 0.97 | 7.6 | 25 25.8 | 3 22.0 | − 1 59.8 | +0.1054 | .5820 | .1384 | +51 | −21 |
| $\psi^1$ Cancri | 6½ | +1.04 | + 7.4 | +26 12.6 | 6 42.2 | + 1 12.5 | −1.1601 | .5790 | −.1474 | −29 | −64 |
| $\psi^2$ Cancri | 6 | 1.03 | 7.2 | 25 53.1 | 6 48.4 | + 1 18.5 | −0.8457 | .5789 | .1478 | − 3 | −64 |
| λ Cancri | 6 | 1.08 | 6.4 | 24 24.8 | 10 51.8 | + 5 12.3 | +0.0228 | .5752 | .1583 | +46 | −27 |
| $\upsilon^1$ Cancri, *mult.* | 7 | 1.14 | 6.3 | 24 56.4 | 13 19.9 | + 7 34.7 | −0.9101 | .5728 | .1644 | − 7 | −65 |
| $\upsilon^2$ Cancri | 6½ | 1.14 | 6.1 | 24 33.4 | 14 7.8 | + 8 20.8 | −0.6531 | .5720 | .1664 | + 9 | −64 |
| $\upsilon^3$ Cancri | 6 | 1.15 | 6.0 | 24 29.9 | 15 18.8 | + 9 29.1 | −0.7940 | .5710 | .1690 | 0 | −66 |
| 32 Cancri | 6 | +1.16 | + 5.9 | +24 30.4 | 15 55.4 | +10 4.2 | −0.9055 | .5703 | −.1708 | − 7 | −66 |
| γ Cancri | 4½ | 1.18 | 4.7 | 21 54.9 | 20 12.7 | − 9 48.1 | +0.9761 | .5663 | .1805 | +90 | +21 |
| 8 Leonis | 6 | +1.43 | + 0.1 | +16 59.6 | **30** 19 30.1 | −11 21.0 | +1.2630 | .5442 | −.2249 | +90 | +39 |
| **MAY.** | | | | | | | | | | | |
| 34 Leonis | 6 | +1.59 | − 2.7 | +13 57.9 | **1** 11 29.0 | + 4 5.7 | +0.6132 | .5307 | −.2465 | +85 | − 9 |
| 37 Leonis | 6 | 1.62 | 2.9 | 14 20.7 | 13 52.4 | + 6 24.5 | −0.3720 | .5288 | .2492 | +25 | −60 |
| *l* Leonis | 5 | 1.73 | 5.7 | 11 12.0 | **2** 5 43.9 | − 2 14.1 | −1.1833 | .5182 | .2634 | −22 | −79 |
| χ Leonis | 5 | 1.77 | 7.4 | 8 0.2 | 13 39.3 | + 5 26.8 | +0.0409 | .5140 | .2646 | +47 | −41 |
| σ Leonis | 4 | 1.82 | 8.8 | 6 42.4 | 21 49.8 | −10 37.6 | −0.8106 | .5103 | .2718 | + 3 | −70 |
| 89 Leonis | 6 | 1.85 | 10.3 | 3 44.8 | **3** 4 38.9 | − 4 0.7 | +0.4352 | .5077 | .2738 | +70 | −22 |
| β Virginis | 3½ | +1.89 | −11.2 | + 2 27.6 | 13 3.7 | + 4 9.3 | −0.5201 | .5054 | −.2749 | +18 | −76 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### MAY.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| B. A. C. 4043 | 6½ | +1.91 | -12.0 | + 1 13.0 | 3 17 29.4 | + 8 27.3 | -0.4262 | .5044 | -.2749 | +23 | -69 |
| B. A. C. 4200 | 6 | 1.98 | 14.2 | - 3 56.0 | 4 8 37.5 | - 0 50.9 | +0.8833 | .5028 | .2724 | +86 | + 1 |
| B. A. C. 4225 | 6½ | 1.99 | 14.5 | 4 22.3 | 10 37.0 | + 1 5.1 | +0.8093 | .5028 | .2718 | +72 | - 3 |
| *f* Virginis | 6 | 2.01 | 14.7 | 5 9.1 | 13 19.7 | + 3 43.1 | +0.9043 | .5028 | .2707 | +85 | + 3 |
| B. A. C. 4255 | 6½ | 2.03 | 14.5 | 3 41.7 | 14 21.3 | + 4 42.9 | -0.9251 | .5028 | .2703 | - 4 | -90 |
| B. A. C. 4294 | 6½ | 2.04 | 15.2 | 5 37.6 | 18 59.8 | + 9 13.4 | -0.1168 | .5031 | .2682 | +38 | -51 |
| B. A. C. 4394 | 6 | +2.10 | -16.2 | - 8 19.4 | 5 6 1.0 | - 4 4.5 | -0.1550 | .5045 | -.2615 | +35 | -53 |
| 50 Virginis | 6 | 2.09 | 16.4 | 9 40.3 | 6 38.3 | - 3 28.3 | +1.1264 | .5046 | .2610 | +81 | +18 |
| 58 Virginis | 6 | 2.13 | 16.7 | 9 53.8 | 10 40.2 | + 0 26.6 | +0.3222 | .5053 | .2581 | +60 | -28 |
| *a* Virginis | 1 | 2.14 | 16.8 | 10 31.1 | 14 41.7 | + 4 21.1 | -0.0432 | .5063 | .2548 | +40 | -47 |
| *i* Virginis | 6 | 2.15 | 17.1 | 12 4.0 | 15 28.8 | + 5 6.8 | +1.4207 | .5065 | .2542 | +78 | +57 |
| B. A. C. 4531 | 6 | 2.16 | 17.2 | 12 34.9 | 19 35.8 | + 9 6.5 | +0.9384 | .5076 | .2505 | +78 | + 6 |
| 86 Virginis | 6 | +2.21 | -17.3 | -11 48.6 | 6 1 25.0 | - 9 14.6 | -1.3348 | .5094 | -.2446 | -42 | -90 |
| B. A. C. 4679 | 6½ | 2.26 | 17.6 | 14 22.8 | 10 51.0 | - 0 5.5 | -0.8211 | .5126 | .2319 | - 4 | -90 |
| B. A. C. 4700 | 6 | 2.27 | 17.6 | 15 43.2 | 14 3.9 | + 3 1.6 | -0.1156 | .5138 | .2299 | +33 | -51 |
| B. A. C. 4923 | 6 | 2.40 | 17.3 | 20 51.5 | 7 13 1.7 | + 1 17.2 | +0.5649 | .5239 | .1957 | +64 | -14 |
| B. A. C. 5023 | 6 | 2.45 | 16.8 | 21 56.7 | 22 12 7 | +10 10.6 | +0.0271 | .5280 | .1796 | +33 | -43 |
| 42 Libræ | 5½ | 2.52 | 16.2 | 23 25.1 | 8 9 30.6 | - 2 53.4 | -0.2662 | .5231 | .1578 | +16 | -60 |
| B. A. C. 5197 | 6 | +2.54 | -15.8 | -24 19.7 | 12 5.8 | - 0 23.3 | +0.3388 | .5343 | -.1523 | +47 | -26 |
| *b* Scorpii | 5 | 2.55 | 15.5 | 25 22.6 | 14 28.1 | + 1 54.3 | +1.1285 | .5353 | .1474 | +65 | +25 |
| A$^2$ Scorp., *mult.* | 5 | 2.56 | 15.4 | 24 57.6 | 15 42.2 | + 3 6.0 | +0.4898 | .5358 | .1448 | +55 | -18 |
| B. A. C. 5253 | 6 | 2.55 | 15.5 | 24 9.9 | 15 51.3 | + 3 14.8 | -0.4039 | .5359 | .1444 | + 8 | -70 |
| B. A. C. 5254 | 6 | 2.54 | 15.5 | 23 36.7 | 15 53.0 | + 3 16.4 | -1.0170 | .5359 | .1444 | -27 | -90 |
| B. A. C. 5255 | 6 | 2.56 | 15.4 | 25 2.7 | 15 58.7 | + 3 22.0 | +0.5442 | .5359 | .1442 | +58 | -15 |
| 3 Scorpii | 6 | +2.56 | -15.4 | -24 52.8 | 16 11.5 | + 3 34.3 | +0.3327 | .5360 | -.1438 | +46 | -26 |
| B. A. C. 5286 | 6½ | 2.55 | 15.3 | 24 29.1 | 18 1.3 | + 5 20.5 | -0.3614 | 5368 | .1396 | +10 | -67 |
| *π* Scorpii | 3 | 2.57 | 15.3 | 25 45.6 | 18 7.0 | + 5 26.0 | +1.0264 | .5368 | .1394 | +64 | +16 |
| B. A. C. 5314 | 6 | 2.58 | 15.1 | 25 31.3 | 20 12.2 | + 7 27.1 | +0.4802 | .5376 | .1351 | +53 | -19 |
| B. A. C. 5347 | 5 | 2.59 | 14.9 | 25 59.8 | 22 23.1 | + 9 33.7 | +0.7133 | .5385 | .1302 | +64 | - 4 |
| *σ* Scorpii | 3½ | 2.58 | 14.4 | 25 17.8 | 9 4 23.8 | - 8 37.7 | -0.7987 | .5407 | .1166 | -16 | -90 |
| *a* Scorpii | 1½ | +2.60 | -14.0 | -26 9.5 | 8 7.1 | - 5 8.9 | -0.2682 | .5419 | -.1078 | +11 | -61 |
| B. A. C. 5800 | 6½ | 2.60 | 11.4 | 26 50.3 | 10 4 16.0 | - 9 34.6 | -1.2067 | .5469 | .0588 | -52 | -90 |
| 43 Ophiuchi | 6 | 2.63 | 10.8 | 28 1.4 | 8 18.3 | - 5 40.6 | -0.1113 | .5474 | .0487 | +13 | -51 |
| 3 Sagittarii | 5 | 2.59 | 9.3 | 27 47.0 | 19 4.4 | + 4 43.0 | -0.7511 | .5480 | .0210 | -23 | -90 |
| B. A. C. 6063 | 6½ | 2.59 | 8.6 | 28 2.8 | 23 7.9 | + 8 38.1 | -0.5238 | .5479 | .0104 | -12 | -81 |
| B. A. C. 6072 | 6½ | 2.61 | 8.5 | 28 44.5 | 23 58.4 | + 9 26.8 | +0.2380 | .5479 | .0083 | +28 | -31 |
| *γ*$^1$ Sagittarii | 4 | +2.61 | - 7.8 | -29 35.1 | 11 2 47.1 | -11 50.3 | +1.1609 | .5477 | -.0011 | +61 | +33 |
| B. A. C. 6120 | 6½ | 2.58 | 8.0 | 28 22.3 | 3 36.0 | -11 3.2 | -0.1851 | .5477 | +.0009 | + 5 | -56 |
| B. A. C. 6127 | 5 | 2.58 | 7.9 | 28 28.3 | 4 10.5 | -10 29.9 | -0.0739 | .5476 | .0025 | +10 | -49 |
| B. A. C. 6190 | 6½ | 2.56 | 7.1 | 28 41.5 | 8 18.8 | - 6 30.2 | +0.2033 | .5471 | .0132 | +26 | -34 |
| B. A. C. 6191 | 6½ | 2.55 | 7.2 | 28 19.6 | 8 19.2 | - 6 29.8 | -0.2025 | .5471 | .0132 | + 5 | -58 |
| B. A. C. 6220 | 6½ | 2.58 | 6.9 | 28 29.3 | 10 22.5 | - 4 30.8 | +0.0100 | .5468 | .0184 | +16 | -45 |
| *ϕ* Sagittarii | 3½ | +2.46 | - 5.7 | -27 7.1 | 20 59.8 | + 5 44.7 | -1.1735 | .5447 | +.0452 | -50 | -90 |
| *τ* Sagittarii | 3½ | 2.41 | 4.1 | 27 51.0 | 12 6 35.7 | - 8 59.2 | +0.1884 | .5421 | .0689 | +31 | -34 |
| B. A. C. 6628 | 6 | 2.34 | 2.8 | 28 6.2 | 14 35.9 | - 1 15.3 | +1.0967 | .5392 | .0880 | +62 | +24 |
| B. A. C. 6666 | 6 | 2.30 | 2.8 | 27 14.3 | 17 4.9 | + 1 8.7 | +0.3634 | .5382 | .0938 | +42 | -24 |
| *ω* Sagittarii | 5 | 2.19 | 1.4 | 26 37.6 | 13 5 8.7 | -11 11.6 | +0.9817 | .5331 | .1210 | +64 | +14 |
| A Sagittarii | 5 | 2.16 | 1.1 | 26 31.8 | 6 37.3 | - 9 45.9 | +1.0546 | .5324 | .1243 | +64 | +19 |
| B. A. C. 7049 | 6 | +1.96 | - 0.2 | -22 48.1 | 21 15.1 | + 4 26.6 | -1.0245 | 5259 | +.1543 | -26 | -90 |
| 17 Capricorni | 6 | 1.86 | + 0.5 | 21 57.8 | 14 5 20.5 | -11 46.5 | -0.6356 | .5219 | .1696 | - 1 | -90 |
| B. A. C. 7197 | 6 | 1.86 | 1.1 | 23 11.2 | 6 23.4 | -10 45.6 | +0.8902 | .5214 | .1714 | +67 | + 6 |
| *η* Capricorni | 5½ | 1.73 | 1.2 | 20 20.6 | 14 21.4 | - 3 2.5 | -0.8128 | .5177 | .1855 | - 9 | -90 |
| *χ* Capricorni | 6 | 1.74 | 1.8 | 21 41.4 | 16 23.6 | - 1 4.0 | +1.0454 | .5169 | .1889 | +69 | +16 |
| 27 Capricorni | 6 | +1.73 | + 1.7 | -21 3.1 | 16 53.5 | - 0 35.1 | +0.4403 | .5166 | +.1897 | +57 | -21 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### MAY.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | Δα | Δδ | | | | | | | | |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| φ Capricorni | 5½ | +1.69 | +2.0 | -21 9.9 | **14** 19 56.1 | + 2 21.9 | +1.1468 | .5153 | +.1947 | +69 | +23 |
| γ Capricorni | 3½ | 1.49 | 2.2 | 17 13.2 | **15** 8 21.0 | - 9 35.8 | -0.6281 | .5106 | .2136 | + 5 | -87 |
| δ Capricorni | 3 | 1.45 | 2.4 | 16 41.3 | 11 54.3 | - 6 8.9 | -0.4397 | .5093 | .2184 | +15 | -71 |
| ι Aquarii | 4 | 1.31 | 2.7 | 14 28.2 | 21 56.9 | + 3 35.8 | -0.5859 | .5064 | .2316 | +10 | -82 |
| 42 Aquarii | 6 | 1.23 | 2.8 | 13 26.9 | **16** 3 20.9 | + 8 50.3 | -0.4223 | .5049 | .2379 | +19 | -70 |
| 45 Aquarii | 6 | 1.23 | 3.1 | 13 55.4 | 4 29.5 | + 9 56.9 | +0.3643 | .5048 | .2392 | +60 | -26 |
| 50 Aquarii | 6 | +1.22 | +3.5 | -14 9.4 | 7 19.8 | -11 17.7 | +1.2972 | .5042 | +.2423 | +76 | +34 |
| B. A. C. 7835 | 6½ | 1.17 | 3.5 | 13 32.9 | 10 14.5 | - 8 28.2 | +1.3499 | .5036 | .2454 | +77 | +41 |
| σ Aquarii | 4½ | 1.14 | 2.8 | 11 18.6 | 10 36.2 | - 8 7.1 | -0.9714 | .5036 | .2457 | -11 | -90 |
| 58 Aquarii | 6 | 1.13 | 3.0 | 11 32.4 | 11 8.6 | - 7 35.6 | -0.5925 | .5034 | .2463 | +11 | -82 |
| 64 Aquarii | 6½ | 1.09 | 3.0 | 10 40.3 | 15 8.1 | - 3 43.2 | -0.5336 | .5030 | .2503 | +15 | -77 |
| Saturn | | | | 10 16.5 | 18 0.3 | - 0 55.9 | -0.2356 | .5007 | .2521 | +30 | -57 |
| 70 Aquarii | 6 | +1.04 | +3.7 | -11 12.5 | 19 58.5 | + 0 58.8 | +1.2642 | .5026 | +.2547 | +79 | +30 |
| λ Aquarii | 4 | 0.98 | 2.8 | 8 14.3 | 22 9.7 | + 3 6.1 | -1.3574 | .5025 | .2566 | -41 | -90 |
| 81 Aquarii | 6 | 0.92 | 3.0 | 7 43.6 | **17** 2 47.2 | + 7 35.6 | -0.7065 | .5025 | .2603 | + 7 | -90 |
| 82 Aquarii | 6 | 0.92 | 2.8 | 7 14.3 | 3 23.6 | + 8 11.0 | -1.0683 | .5025 | .2608 | -15 | -90 |
| h¹ Aquarii | 5½ | 0.91 | 3.4 | 8 21.7 | 4 45.3 | + 9 30.3 | +0.4852 | .5024 | .2618 | +71 | -20 |
| h² Aquarii | 7 | 0.91 | 3.4 | 8 25.2 | 4 50.6 | + 9 35.4 | +0.5717 | .5024 | .2619 | +76 | -15 |
| h³ Aquarii | 7 | +0.91 | +3.5 | - 8 36.2 | 5 8.3 | + 9 52.7 | +0.8431 | .5024 | +.2621 | +82 | - 1 |
| h⁴ Aquarii | 7½ | 0.90 | 3.5 | 8 21.6 | 5 50.3 | +10 33.4 | +0.7667 | .5025 | .2626 | +78 | - 6 |
| ψ Aquarii | 4½ | 0.85 | 3.2 | 6 43.0 | 9 35.3 | - 9 48.1 | +0.0070 | .5026 | .2647 | +44 | -44 |
| 96 Aquarii | 5½ | 0.81 | 3.2 | 5 48.0 | 12 14.9 | - 7 13.2 | -0.2579 | .5028 | .2669 | +31 | -59 |
| B. A. C. 8134 | 6½ | 0.80 | 3.2 | 5 21.0 | 13 17.8 | - 6 12.1 | -0.4558 | .5030 | .2675 | +21 | -71 |
| B. A. C. 8184 | 5½ | 0.76 | 3.5 | 5 12.5 | 17 34.0 | - 2 3.3 | +0.5414 | .5036 | .2700 | +76 | -17 |
| 20 Piscium | 6 | +0.65 | +3.7 | - 3 27.0 | **18** 3 10.9 | + 7 16.7 | +1.2999 | .5057 | +.2742 | +87 | +32 |
| B. A. C. 8311 | 6½ | 0.59 | 3.1 | 0 34.8 | 6 44.1 | +10 43.6 | -0.7376 | .5068 | .2753 | + 7 | -90 |
| B. A. C. 8365 | 6½ | 0.54 | 3.9 | - 1 11.4 | 12 1.9 | - 8 8.0 | +1.3618 | .5086 | .2766 | +89 | +38 |
| B. A. C. 57 | 6½ | 0.47 | 3.7 | + 1 0.0 | 18 31.7 | - 1 49.8 | +0.8740 | .5114 | .2774 | +90 | + 1 |
| 60 Piscium | 6 | 0.30 | 3.4 | 6 3.9 | **19** 9 20.3 | -11 28.3 | -0.2670 | .5194 | .2761 | +31 | -58 |
| 62 Piscium | 6 | 0.29 | 3.3 | 6 37.4 | 9 46.2 | -11 3.3 | -0.7236 | .5196 | .2760 | + 8 | -83 |
| B. A. C. 221 | 6 | +0.30 | +3.8 | + 4 38.6 | 9 46.8 | -11 2.7 | +1.3183 | .5196 | +.2760 | +90 | +35 |
| δ Piscium | 4½ | 0.28 | 3.2 | 6 54.6 | 9 57.8 | -10 50.0 | -0.9652 | .5198 | .2759 | - 6 | -83 |
| ε Piscium | 4 | 0.24 | 3.7 | 7 13.4 | 16 55.4 | - 4 7.5 | +0.6262 | .5246 | .2733 | +85 | -11 |
| π Piscium | 6 | 0.07 | 4.2 | 11 30.5 | **20** 9 0.2 | +11 25.9 | +0.5695 | .5374 | .2627 | +80 | -13 |
| 104 Piscium | 6½ | +0.05 | 3.8 | 13 39.5 | 9 57.9 | -11 38.3 | -1.3583 | .5383 | .2618 | -42 | -77 |
| 27 Arietis | 6 | -0.08 | 5.3 | 17 9.4 | **21** 8 41.4 | +10 17.6 | +0.7734 | .5608 | .2328 | +90 | + 3 |
| 136 Tauri | 5 | +0.09 | +9.3 | +27 35.0 | **24** 12 25.9 | +10 53.0 | +0.8582 | .6175 | +.0152 | +90 | +30 |
| B. A. C. 1882 | 6½ | 0.10 | 9.5 | 28 52.4 | 13 32.1 | +11 56.2 | -0.4451 | .6176 | +.0112 | +19 | -41 |
| κ Aurigæ | 4½ | 0.17 | 9.8 | 29 32.6 | 20 7.2 | - 5 46.5 | -1.0627 | .6168 | -.0130 | -22 | -61 |
| B. A. C 2097 | 6½ | 0.24 | 9.4 | 28 17.6 | **25** 1 25.1 | - 0 42.7 | +0.0491 | .6153 | .0324 | +47 | -14 |
| 49 Aurigæ | 5½ | 0.26 | 9.4 | 28 7.2 | 3 7.7 | + 0 55.3 | +0.1602 | .6146 | .0385 | +54 | - 9 |
| 53 Aurigæ | 6 | 0.27 | 9.5 | 29 5.4 | 4 14.0 | + 1 58.6 | -0.8422 | .6142 | .0425 | - 5 | -61 |
| 54 Aurigæ | 6 | +0.28 | +9.5 | +28 22.4 | 4 39.8 | + 2 23.3 | -0.1528 | .6140 | -.0436 | +36 | -26 |
| 28 Geminor. | 6 | 0.31 | 9.4 | 29 5.8 | 6 29.6 | + 4 8.2 | -0.9532 | .6132 | .0503 | -13 | -61 |
| 47 Geminor. | 6 | 0.43 | 8.9 | 27 3.7 | 16 4.6 | -10 42.0 | +0.4140 | .6076 | .0836 | +71 | 0 |
| 53 Geminor. | 6 | 0.46 | 9.0 | 28 6.8 | 17 42.6 | - 9 8.2 | -0.7682 | .6065 | .0888 | 0 | -62 |
| 59 Geminor. | 6½ | 0.51 | 8.8 | 27 52.7 | 20 51.0 | - 6 7.9 | -0.8318 | .6041 | .0994 | - 4 | -62 |
| ι Geminorum | 4 | 0.51 | 8.9 | 28 2.7 | 21 17.0 | - 5 43.0 | -1.0404 | .6038 | .1007 | -19 | -62 |
| υ Geminorum | 4½ | +0.55 | +8.5 | +27 10.3 | **26** 1 3.1 | - 2 6.6 | -0.5782 | .6006 | -.1127 | +12 | -56 |
| c Geminorum | 6 | 0.59 | 8.0 | 26 4.8 | 4 7.0 | + 0 49.5 | +0.1451 | .5978 | .1225 | +53 | -17 |
| ω¹ Cancri | 6 | 0.69 | 7.5 | 25 44.0 | 10 27.9 | + 6 54.7 | -0.3461 | .5921 | .1411 | +25 | -45 |
| ω² Cancri | 6½ | 0.69 | 7.4 | 25 25.8 | 10 46.6 | + 7 12.5 | -0 0895 | .5917 | .1419 | +39 | -31 |
| ψ² Cancri | 6 | 0.74 | 7.3 | 25 53.0 | 14 6.9 | +10 24.7 | -1.0309 | .5883 | .1513 | -17 | -64 |
| λ Cancri | 6 | +0.78 | +6.6 | +24 24.8 | 18 3.3 | - 9 48.5 | -0.1806 | .5843 | -.1618 | +35 | -38 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### MAY.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| $\upsilon^1$ Cancri, *mult.* | 7 | +0.82 | + 6.7 | +24 56.4 | **26** 20 27.2 | − 7 30.3 | −1.1026 | .5818 | −.1679 | −22 | −65 |
| $\upsilon^2$ Cancri | 6½ | 0.83 | 6.5 | 24 33.4 | 21 13.7 | − 6 45.7 | −0.8505 | .5810 | .1700 | − 4 | −66 |
| $\upsilon^3$ Cancri | 6 | 0.84 | 6.3 | 24 29.9 | 22 22.8 | − 5 39.3 | −0.9913 | .5798 | .1727 | −13 | −66 |
| 38 Cancri | 6 | 0.85 | 6.4 | 24 30.4 | 22 58.3 | − 5 5.2 | −1.1013 | .5792 | .1741 | −22 | −66 |
| γ Cancri | 4½ | 0.88 | 5.1 | 21 54.9 | **27** 3 8.6 | − 1 4.6 | +0.7485 | .5746 | .1840 | +90 | + 8 |
| δ Leonis | 6 | 1.11 | + 1.4 | 16 59.6 | **28** 1 52.1 | − 3 11.5 | +1.0132 | .5503 | .2278 | +90 | +18 |
| 34 Leonis | 6 | +1.28 | − 1.3 | +13 57.9 | 17 32.8 | +11 57.0 | +0.3631 | .5351 | −.2486 | +66 | −21 |
| 37 Leonis | 6 | 1.31 | 1.3 | 14 20.7 | 19 53.9 | − 9 46.5 | −0.6133 | .5331 | .2511 | +13 | −74 |
| *l* Leonis | 5 | 1.44 | 3.9 | 11 12.0 | **29** 11 32.6 | + 5 21.9 | −1.4213 | .5211 | .2642 | −56 | −79 |
| χ Leonis | 5 | 1.49 | 5.9 | 8 0.2 | 19 23.4 | −11 1.7 | −0.2041 | .5158 | .2685 | +34 | −54 |
| σ Leonis | 4 | 1.57 | 7.0 | 6 42.4 | **30** 3 30.3 | − 3 9.7 | −1.0481 | .5113 | .2716 | −12 | −84 |
| τ Leonis | 5 | 1.56 | 8.5 | 3 32.2 | 6 58.6 | + 0 12.4 | +1.3176 | .5097 | .2724 | +90 | +34 |
| 89 Leonis | 6 | +1.61 | − 8.8 | + 3 44.8 | 10 17.3 | + 3 25.2 | +0.1963 | .5082 | −.2731 | +55 | −34 |
| β Virginis | 3½ | 1.68 | 9.9 | 2 27.6 | 18 40.6 | +11 33.6 | −0.7501 | .5052 | .2737 | + 6 | −83 |
| B. A. C. 4043 | 6½ | 1.70 | 10.6 | + 1 13.0 | 23 5.9 | − 8 8.8 | −0.6521 | .5038 | .2735 | +11 | −86 |
| B. A. C. 4200 | 6 | 1.82 | 13.3 | − 3 56.0 | **31** 14 15.0 | + 6 34.0 | +0.6745 | .5011 | .2701 | +86 | −10 |
| B. A. C. 4225 | 6½ | 1.83 | 13.6 | 4 22.3 | 16 14.8 | + 8 30.3 | +0.6034 | .5011 | .2694 | +81 | −14 |
| *f* Virginis | 6 | 1.85 | 14.0 | 5 9.1 | 18 58.1 | +11 8.9 | +0.7024 | .5010 | .2683 | +85 | − 9 |
| B. A. C. 4255 | 6½ | +1.89 | −13.6 | − 3 41.6 | 19 59.9 | −11 51.1 | −1.1264 | .5010 | −.2679 | −18 | −90 |
| **JUNE.** | | | | | | | | | | | |
| B. A. C. 4294 | 6½ | +1.91 | −14.4 | − 5 37.6 | **1** 0 39.6 | − 7 19.4 | −0.3107 | .5012 | −.2655 | +28 | −62 |
| B. A. C. 4394 | 6 | 2.00 | 15.8 | 8 19.4 | 11 44.3 | + 3 26.2 | −0.3313 | .5020 | .2586 | +26 | −63 |
| 50 Virginis | 6 | 2.00 | 16.2 | 9 40.3 | 12 21.9 | + 4 2.7 | +0.9534 | .5021 | .2582 | +81 | + 6 |
| 58 Virginis | 6 | +2.04 | −16.4 | − 9 53.8 | 16 25.3 | + 7 59.1 | +0.1550 | .5029 | −.2550 | +50 | −36 |
| α Virginis | 1 | 2.08 | 16.7 | 10 31.1 | 20 28.4 | +11 55.2 | −0.2034 | .5036 | .2518 | +31 | −56 |
| *i* Virginis | 6 | 2.09 | 17.0 | 12 4.0 | 21 15.9 | −11 18.7 | +1.2653 | .5038 | .2511 | +78 | +30 |
| B. A. C. 4531 | 6 | 2.12 | 17.2 | 12 34.9 | **2** 1 24.7 | − 7 17.1 | +0.7899 | .5049 | .2474 | +71 | − 3 |
| B. A. C. 4679 | 6½ | 2.28 | 17.9 | 14 22.8 | 16 47.1 | + 7 38.1 | −0.9445 | .5099 | .2307 | −11 | −90 |
| B. A. C. 4700 | 6 | 2.31 | 18.0 | 15 43.2 | 20 1.5 | +10 46.7 | −0.2294 | .5112 | .2267 | +27 | −58 |
| B. A. C. 4722 | 6 | +2.34 | −18.4 | −17 37.6 | 22 19.4 | −10 59.5 | +1.3246 | .5121 | −.2236 | +73 | +41 |
| B. A. C. 4923 | 6 | 2.57 | 18.5 | 20 51.6 | **3** 19 10.3 | + 9 13.2 | +0.5030 | .5215 | .1928 | +61 | −18 |
| B. A. C. 5023 | 6 | 2.65 | 18.0 | 21 56.7 | **4** 4 25.3 | − 5 49.2 | −0.0168 | .5261 | .1766 | +31 | −46 |
| 42 Libræ | 5½ | 2.78 | 17.3 | 23 25.1 | 15 47.6 | + 5 11.1 | −0.2863 | .5316 | .1550 | +15 | −62 |
| B. A. C. 5197 | 6 | 2.82 | 17.2 | 24 19.7 | 18 23.6 | + 7 42.1 | +0.3202 | .5329 | .1497 | +46 | −27 |
| *b* Scorpii | 5 | 2.86 | 17.0 | 25 22.6 | 20 46.7 | +10 0.4 | +1.1233 | .5340 | .1448 | +65 | +25 |
| A$^2$ Scorp., *mult.* | 5 | +2.86 | −16.9 | −24 57.6 | 22 1.3 | +11 12.6 | +0.4854 | .5346 | −.1422 | +54 | −18 |
| B. A. C. 5253 | 6 | 2.85 | 16.8 | 24 10.0 | 22 10.4 | +11 21.4 | −0.4102 | .5347 | .1419 | + 7 | −71 |
| B. A. C. 5254 | 6 | 2.84 | 16.8 | 23 36.7 | 22 12.1 | +11 23.0 | −1.0249 | .5347 | .1418 | −28 | −90 |
| B. A. C. 5255 | 6 | 2.86 | 16.9 | 25 2.7 | 22 17.8 | +11 28.6 | +0.5401 | .5347 | .1417 | +57 | −15 |
| 3 Scorpii | 6 | 2.86 | 16.9 | 24 52.8 | 22 30.7 | +11 41.0 | +0.3291 | .5348 | .1413 | +45 | −26 |
| B. A. C. 5286 | 6½ | 2.87 | 16.7 | 24 29.1 | **5** 0 21.1 | −10 32.2 | −0.3629 | .5357 | .1372 | + 9 | −67 |
| π Scorpii | 3 | +2.90 | −16.8 | −25 45.6 | 0 26.8 | −10 26.7 | +1.0290 | .5357 | −.1371 | +64 | +17 |
| B. A. C. 5314 | 6 | 2.91 | 16.4 | 25 31.4 | 2 32.6 | − 8 25.0 | +0.4853 | .5366 | .1326 | +53 | −18 |
| B. A. C. 5347 | 5 | 2.93 | 16.2 | 25 59.9 | 4 44.2 | − 6 17.8 | +0.7239 | .5375 | .1277 | +64 | − 4 |
| σ Scorpii | 3½ | 2.97 | 15.6 | 25 17.9 | 10 46.5 | − 0 27.6 | −0.7798 | .5400 | .1143 | −16 | −90 |
| α Scorpii | 1½ | 3.02 | 15.2 | 26 9.5 | 14 30.8 | + 3 9.1 | −0.2396 | .5414 | .1058 | +12 | −59 |
| B. A. C. 5800 | 6½ | 3.14 | 12.4 | 26 50.2 | **6** 10 43.6 | − 1 19.4 | −1.1389 | .5472 | .0567 | −46 | −90 |
| 43 Ophiuchi | 6 | +3.19 | −11.7 | −28 1.4 | 14 46.1 | + 2 34.8 | −0.0325 | .5479 | −.0466 | +17 | −46 |
| 3 Sagittarii | 5 | 3.21 | 9.9 | 27 47.0 | **7** 1 33.2 | −11 0.6 | −0.6524 | .5487 | .0190 | −18 | −90 |
| B. A. C. 6063 | 6½ | 3.22 | 9.1 | 28 2.8 | 5 37.1 | − 7 5.1 | −0.4168 | .5487 | .0085 | − 6 | −72 |
| B. A. C. 6072 | 6½ | 3.24 | 9.0 | 28 44.5 | 6 27.7 | − 6 16.3 | +0.3481 | .5487 | −.0064 | +33 | −25 |
| B. A. C. 6120 | 6½ | 3.24 | 8.3 | 28 22.3 | 10 5.5 | − 2 46.1 | −0.0687 | .5486 | +.0022 | +11 | −49 |
| B. A. C. 6127 | 5 | +3.23 | − 8.2 | −28 28.3 | 10 40.0 | − 2 12.8 | +0.0439 | .5485 | +.0043 | +17 | −42 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### JUNE.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | $Y$ | $x'$ | $y'$ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| B. A. C. 6190 | 6½ | +3.25 | -7.4 | -28 41.5 | 7 14 48.6 | + 1 47.2 | +0.3295 | .5481 | +.0149 | +33 | -26 |
| B. A. C. 6191 | 6½ | 3.24 | 7.4 | 28 19.6 | 14 49.0 | + 1 47.6 | -0.0768 | .5481 | .0151 | +12 | -49 |
| B. A. C. 6220 | 6½ | 3.29 | 7.1 | 28 29.3 | 16 52.3 | + 3 46.6 | +0.1399 | .5479 | .0202 | +23 | -36 |
| φ Sagittarii | 3½ | 3.19 | 5.1 | 27 7.0 | 8 3 30.3 | - 9 57.5 | -1.0257 | .5459 | .0471 | -38 | -90 |
| τ Sagittarii | 3½ | 3.19 | 3.3 | 27 51.0 | 13 6.8 | - 0 40.6 | +0.3559 | .5431 | .0707 | +40 | -24 |
| B. A. C. 6628 | 6 | 3.18 | 1.8 | 28 6.2 | 9 21 7.8 | + 7 4.2 | +1.2809 | .5401 | .0899 | +62 | +53 |
| B. A. C. 6666 | 6 | +3.13 | -1.3 | -27 14.3 | 23 37.1 | + 9 28.5 | +0.5505 | .5391 | +.0957 | +54 | -14 |
| ω Sagittarii | 5 | 3.05 | +0.6 | 26 37.6 | 11 42.7 | - 2 50.0 | +1.1910 | .5339 | .1225 | +64 | +33 |
| A Sagittarii | 5 | 3.05 | 0.9 | 26 31.7 | 13 11.6 | - 1 24.0 | +1.2668 | .5330 | .1257 | +64 | +44 |
| B. A. C. 7049 | 6 | 2.85 | 2.7 | 22 48.0 | 10 3 53.3 | -11 10.8 | -0.7954 | .5257 | .1556 | -12 | -90 |
| 17 Capricorni | 6 | 2.74 | 3.9 | 21 57.7 | 12 1.7 | - 3 17.8 | -0.3936 | .5214 | .1707 | +12 | -69 |
| B. A. C. 7197 | 6 | 2.77 | 4.4 | 23 11.2 | 13 5.0 | - 2 16.5 | +1.1400 | .5208 | .1725 | +67 | +25 |
| η Capricorni | 5½ | +2.63 | +4.9 | -20 20.6 | 21 6.8 | + 5 30.5 | -0.5603 | .5168 | +.1862 | + 5 | -82 |
| χ Capricorni | 6 | 2.65 | 5.6 | 21 41.3 | 23 10.1 | + 7 30.0 | +1.3104 | .5158 | .1895 | +69 | +44 |
| 27 Capricorni | 6 | 2.63 | 5.5 | 21 3.1 | 23 40.3 | + 7 59.3 | +0.7027 | .5155 | .1903 | +69 | - 6 |
| 30 Capricorni | 6 | 2.53 | 5.6 | 18 30.0 | 11 3 58.0 | -11 50.8 | -1.2753 | .5134 | .1971 | -42 | -90 |
| γ Capricorni | 3½ | 2.39 | 6.6 | 17 13.2 | 15 17.8 | - 0 51.4 | -0.3539 | .5082 | .2135 | +19 | -65 |
| δ Capricorni | 3 | 2.36 | 6.9 | 16 41.2 | 18 53.8 | + 2 38.2 | -0.1607 | .5068 | .2182 | +29 | -53 |
| ι Aquarii | 4 | +2.22 | +7.5 | -14 28.1 | 12 5 5.1 | -11 28.4 | -0.3000 | .5032 | +.2307 | +24 | -62 |
| 42 Aquarii | 6 | 2.14 | 7 8 | 13 26.8 | 10 34.3 | - 6 8.7 | -0.1314 | .5015 | .2368 | +33 | -52 |
| 45 Aquarii | 6 | 2.13 | 8.1 | 13 55.4 | 11 44.0 | - 5 1.0 | +0.6627 | .5011 | .2380 | +76 | -10 |
| σ Aquarii | 4½ | 2.03 | 7.9 | 11 18.6 | 17 57.3 | + 1 1.6 | -0.6814 | .4996 | .2441 | + 6 | -90 |
| 58 Aquarii | 6 | 2.02 | 8.2 | 11 32.3 | 18 30.2 | + 1 33.6 | -0.2993 | .4995 | .2445 | +26 | -61 |
| 64 Aquarii | 6½ | 1.97 | 8.3 | 10 40.2 | 22 34.3 | + 5 30.7 | -0.2382 | .4986 | .2483 | +30 | -58 |
| SATURN | | | | -10 4.3 | 13 3 11.0 | + 9 59.6 | +0.2683 | .4974 | +.2524 | +57 | -31 |
| λ Aquarii | 4 | +1.87 | +8.3 | 8 14.2 | 5 44.4 | -11 31.4 | -1.0688 | .4976 | .2542 | -16 | -90 |
| 78 Aquarii | 6 | 1.85 | 8.2 | 7 51.6 | 6 47.7 | -10 29.8 | -1.2064 | .4975 | .2549 | -26 | -90 |
| 81 Aquarii | 6 | 1.82 | 8.6 | 7 43.5 | 10 27.8 | - 6 56.0 | -0.4115 | .4973 | .2576 | +22 | -68 |
| 82 Aquarii | 6 | 1.80 | 8.5 | 7 14.2 | 11 5.0 | - 6 19.8 | -0.7771 | .4971 | .2580 | + 3 | -90 |
| $h^1$ Aquarii | 5½ | 1.81 | 9.0 | 8 21.6 | 12 28.4 | - 4 59.7 | +0.7927 | .4970 | .2589 | +73 | - 3 |
| $h^2$ Aquarii | 7 | +1.81 | +9.0 | - 8 25.3 | 12 33.9 | - 4 53.5 | +0.8800 | .4970 | +.2590 | +92 | + 2 |
| $h^3$ Aquarii | 7 | 1.80 | 9.2 | 8 36.3 | 12 52.0 | - 4 35.8 | +1.1548 | .4970 | .2592 | +92 | +20 |
| $h^4$ Aquarii | 7½ | 1.79 | 9.1 | 8 21.6 | 13 35.0 | - 3 54.1 | +1.0772 | .4970 | .2597 | +92 | +14 |
| φ Aquarii | 4½ | 1.72 | 9.0 | 6 42.9 | 17 25.0 | - 0 10.6 | +0.3086 | .4970 | .2621 | +61 | -29 |
| 96 Aquarii | 5½ | 1.68 | 8.9 | 5 47.9 | 20 8.3 | + 2 28.0 | +0.0407 | .4971 | .2636 | +46 | -43 |
| B. A. C. 8134 | 6½ | 1.68 | 8.8 | 5 20.9 | 21 12.6 | + 3 31.5 | -0.1601 | .4971 | .2642 | +36 | -53 |
| B. A. C. 8184 | 5½ | +1.63 | +9.2 | - 5 12.4 | 14 1 35.0 | + 7 45.5 | +0.8472 | .4974 | +.2663 | -85 | 0 |
| B. A. C. 8311 | 6½ | 1.44 | 8.6 | - 0 34.7 | 15 4.8 | - 3 7.8 | -0.4549 | .5000 | .2710 | +21 | -71 |
| B. A. C. 57 | 6½ | 1.31 | 9.1 | + 1 0.1 | 15 3 11.1 | + 8 37.5 | +1.1652 | .5041 | .2726 | +90 | +20 |
| 60 Piscium | 6 | 1.12 | 8.5 | 6 4.0 | 18 23.5 | - 0 37.2 | -0.0104 | .5120 | .2707 | +44 | -44 |
| 62 Piscium | 6 | 1.10 | 8.3 | 6 37.5 | 18 50.0 | - 0 11.6 | -0.4734 | .5123 | .2706 | +20 | -71 |
| δ Piscium | 4½ | 1.10 | 8.2 | 6 54.7 | 19 2.0 | + 0 0.1 | -0.7181 | .5124 | .2705 | + 8 | -83 |
| ε Piscium | 4 | +1.03 | +8.6 | + 7 13.5 | 16 2 10.7 | + 6 55.8 | +0.8814 | .5171 | +.2680 | +90 | + 3 |
| π Piscium | 6 | 0.85 | 8.2 | 11 30.5 | 18 39.7 | - 1 6.5 | +0.7918 | .5304 | .2574 | +90 | 0 |
| 104 Piscium | 6½ | 0.84 | 7.6 | 13 39.5 | 19 38.8 | - 0 9.4 | -1.1596 | .5313 | .2565 | -21 | -77 |
| 26 Arietis | 6 | 0.59 | 7.4 | 19 18.3 | 17 18 42.6 | - 1 52.9 | -1.2630 | .5548 | .2284 | -34 | -71 |
| 27 Arietis | 6 | 0.61 | 7.9 | 17 9.4 | 18 51.5 | - 1 44.3 | +0.9404 | .5550 | .2281 | +90 | +14 |
| B. A. C. 782 | 6½ | 0.59 | 7.8 | 18 20.1 | 20 0.0 | - 0 38.2 | +0.0106 | .5562 | .2264 | +45 | -36 |
| μ Arietis | 5½ | +0.56 | +7.7 | +19 29.0 | 23 42.9 | + 2 56.6 | -0.3172 | .5603 | +.2199 | +28 | -52 |
| 47 Arietis | 6 | 0.52 | 7.8 | 20 10.3 | 18 6 15.1 | + 9 14.3 | +0.3907 | .5678 | .2079 | +68 | -14 |
| ε Arietis, *mult.* | 4½ | 0.51 | 7.7 | 20 50.7 | 6 43.1 | + 9 41.2 | -0.1867 | .5684 | .2069 | +34 | -43 |
| 66 Arietis | 6½ | 0.44 | 8.0 | 22 22.6 | 18 26.0 | - 3 3.0 | +0.5605 | .5818 | .1811 | +82 | - 2 |
| 7 Tauri | 6 | 0.42 | 7.7 | 24 2.9 | 20 45.0 | - 0 49.6 | -0.6893 | .5843 | .1754 | + 7 | -66 |
| 9 Tauri | 6 | +0.41 | +8.0 | +22 48.1 | 21 45.3 | + 0 8.3 | +0.7256 | .5854 | -.1729 | +90 | + 8 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### JUNE.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| 11 Tauri | 6 | +0.40 | + 7.7 | +24 55.7 | **18** 23 11.2 | + 1 30.7 | -1.1424 | .5870 | +.1690 | -26 | -65 |
| *g* Pleiadum | 5½ | 0.41 | 7.9 | 23 54.0 | **19** 0 45.4 | + 3 1.2 | +0.1422 | .5888 | .1649 | +53 | -22 |
| *b* Pleiadum | 4 | 0.41 | 7.9 | 23 43.4 | 0 47.2 | + 3 2.9 | +0.3216 | .5888 | .1648 | +64 | -13 |
| *m* Pleiadum | 7 | 0.40 | 7.8 | 24 27.0 | 0 53.0 | + 3 8.4 | -0.3830 | .5892 | .1646 | +24 | -49 |
| *e* Pleiadum | 5 | 0.41 | 7.8 | 24 4.7 | 0 54.4 | + 3 9.8 | -0.0105 | .5892 | .1646 | +44 | -29 |
| *c* Pleiadum | 5 | 0.40 | 7.9 | 23 58.8 | 1 8.8 | + 3 23.5 | +0.1259 | .5895 | .1638 | +52 | -22 |
| *d* Pleiadum | 5 | +0.41 | + 8.0 | +23 33.7 | 1 20.7 | + 3 34.9 | +0.5733 | .5897 | +.1633 | +84 | 0 |
| η Tauri | 3 | 0.40 | 7.9 | 23 43.3 | 1 47.1 | + 4 0.3 | +0.4867 | .5901 | .1622 | +77 | - 4 |
| *f* Pleiadum | 4 | 0.41 | 8.0 | 23 40.5 | 2 25.6 | + 4 37.2 | +0.6372 | .5908 | .1603 | +90 | + 4 |
| *h* Pleiadum | 5½ | 0.40 | 7.9 | 23 45.5 | 2 26.1 | + 4 37.7 | +0.5559 | .5908 | .1603 | +82 | 0 |
| B. A. C. 1192 | 6 | 0.38 | 7.7 | 25 12.3 | 2 50.3 | + 5 0.9 | -0.8134 | .5912 | .1593 | - 2 | -65 |
| *p* Tauri | 6 | 0.35 | 8.0 | 26 9.5 | 10 32.0 | -11 36.5 | -0.6094 | .5991 | .1377 | +11 | -59 |
| φ Tauri, *mult.* | 5½ | +0.34 | + 8.0 | +27 3.3 | 14 1.7 | - 8 15.7 | -1.0304 | .6025 | +.1271 | -18 | -63 |
| $\chi^1$ Tauri | 5½ | 0.35 | 8.3 | 25 20.2 | 14 52.6 | - 7 26.9 | +0.7718 | .6032 | .1247 | +90 | +15 |
| $\chi^2$ Tauri | 8½ | 0.35 | 8.3 | 25 20.5 | 14 52.8 | - 7 26.8 | +0.7675 | .6032 | +.1247 | +90 | +15 |
| $\omega^1$ Cancri | 6 | 0.64 | 6.8 | 25 44.0 | **22** 20 3.4 | - 5 41.8 | -0.4925 | .6008 | -.1452 | +17 | -54 |
| $\omega^2$ Cancri | 6½ | 0.64 | 6.8 | 25 25.8 | 20 21.7 | - 5 24.4 | -0.2389 | .6005 | .1461 | +31 | -39 |
| $\psi^2$ Cancri | 6 | 0.68 | 6.6 | 25 53.1 | 23 36.7 | - 2 17.5 | -1.1771 | .5976 | .1554 | -30 | -64 |
| λ Cancri | 6 | +0.70 | + 6.2 | +24 24.8 | **23** 3 26.6 | + 1 22.8 | -0.3457 | .5934 | -.1663 | +26 | -47 |
| $\upsilon^1$ Cancri | 7 | 0.74 | 6.1 | 24 56.4 | 5 46.6 | + 3 37.1 | -1.2610 | .5910 | .1724 | -40 | -65 |
| $\upsilon^2$ Cancri | 6½ | 0.73 | 5.9 | 24 33.4 | 6 31.8 | + 4 20.4 | -1.0141 | .5901 | .1745 | -15 | -66 |
| $\upsilon^3$ Cancri | 6 | 0.76 | 5.9 | 24 29.9 | 7 38.9 | + 5 24.8 | -1.1548 | .5890 | .1774 | -27 | -66 |
| 32 Cancri | 6 | 0.76 | 5.8 | 24 30.4 | 8 13.4 | + 5 57.9 | -1.2653 | .5883 | .1789 | -40 | -66 |
| γ Cancri | 4½ | 0.77 | 5.0 | 21 54.9 | 12 16.6 | + 9 51.3 | +0.5498 | .5841 | .1889 | +81 | - 4 |
| 83 Cancri | 6 | +0.86 | + 2.9 | +18 13.8 | **24** 2 43.2 | - 0 15.7 | +1.2497 | .5679 | -.2198 | +90 | +39 |
| 8 Leonis | 6 | 0.93 | + 2.0 | 16 59.7 | 10 19.4 | + 7 3.6 | +0.7645 | .5596 | .2331 | +90 | + 3 |
| 34 Leonis | 6 | 1.05 | - 0.3 | 13 57.9 | **25** 1 31.6 | - 2 16.4 | +0.0989 | .5437 | .2538 | +50 | -35 |
| 37 Leonis | 6 | 1.09 | 0.3 | 14 20.7 | 3 48.5 | - 0 4.1 | -0.8668 | .5418 | .2562 | - 2 | -76 |
| *c* Leonis | 5 | 1.21 | 4.6 | 6 45.9 | **26** 0 33.3 | - 4 0.3 | +1.3449 | .5241 | .2717 | +90 | +39 |
| χ Leonis | 5 | 1.25 | 4.4 | 8 0.3 | 2 38.3 | - 1 59.2 | -0.4899 | .5229 | .2726 | +20 | -71 |
| σ Leonis | 4 | +1.32 | - 5.6 | + 6 42.4 | 10 32.7 | + 5 40.2 | -1.3295 | .5178 | -.2752 | -35 | -84 |
| τ Leonis | 5 | 1.32 | 7.0 | 3 32.2 | 13 56.0 | + 8 57.3 | +1.0055 | .5158 | .2759 | +90 | + 9 |
| 89 Leonis | 6 | 1.35 | 7.1 | 3 44.8 | 17 10.0 | -11 54.5 | -0.1035 | .5142 | .2763 | +39 | -50 |
| β Virginis | 3½ | 1.43 | 8.3 | 2 27.7 | **27** 1 22.1 | - 3 57.3 | -1.0409 | .5105 | .2765 | -11 | -88 |
| B. A. C. 4043 | 6½ | 1.46 | 9.1 | + 1 13.1 | 5 41.9 | + 0 14.8 | -0.9447 | .5088 | .2760 | - 5 | -89 |
| B. A. C. 4200 | 6 | 1.59 | 11.8 | - 3 55.9 | 20 34.5 | - 9 19.0 | +0.3726 | .5049 | .2717 | +65 | -25 |
| B. A. C. 4225 | 6½ | +1.60 | -12.1 | - 4 22.3 | 22 32.4 | - 7 24.6 | +0.3034 | .5046 | -.2707 | +61 | -29 |
| *f* Virginis | 6 | 1.63 | 12.5 | 5 9.1 | **28** 1 13.1 | - 4 48.6 | +0.4035 | .5041 | .2694 | +67 | -24 |
| B. A. C. 4255 | 6½ | 1.66 | 12.1 | 3 41.6 | 2 14.0 | - 3 49.5 | -1.4099 | .5040 | .2689 | -48 | -90 |
| B. A. C. 4294 | 6½ | 1.69 | 13.0 | 5 37.6 | 6 49.8 | + 0 38.3 | -0.5983 | .5038 | .2662 | +13 | -82 |
| *g* Virginis | 6 | 1.78 | 15.0 | 10 4.8 | 17 25.3 | +10 55.3 | +1.3564 | .5039 | .2588 | +80 | +40 |
| B. A. C. 4394 | 6 | 1.79 | 14.4 | 8 19.4 | 17 46.5 | +11 15.9 | -0.6090 | .5039 | .2586 | +12 | -83 |
| 50 Virginis | 6 | +1.79 | -15.0 | - 9 40.3 | 18 23.7 | +11 52.0 | +0.6686 | .5040 | -.2581 | +80 | -10 |
| 58 Virginis | 6 | 1.85 | 15.2 | 9 53.8 | 21 24.7 | - 9 14.1 | -0.1205 | .5043 | .2548 | +36 | -51 |
| α Virginis | 1 | 1.89 | 15.5 | 10 31.1 | **29** 2 25.7 | - 4 20.2 | -0.4722 | .5047 | .2512 | +18 | -73 |
| *i* Virginis | 6 | 1.90 | 16.1 | 12 4.0 | 3 12.8 | - 3 34.4 | +0.9904 | .5049 | .2505 | +78 | + 9 |
| B. A. C. 4531 | 6 | 1.95 | 16.3 | 12 34.9 | 7 19.7 | + 0 25.3 | +0.5225 | .5057 | .2464 | +70 | -17 |
| B. A. C. 4679 | 6½ | 2.14 | 17.1 | 14 22.8 | 22 37.0 | - 8 44.6 | -1.1820 | .5097 | .2298 | -28 | -90 |
| B. A. C. 4700 | 6 | +2.18 | -17.6 | -15 43 2 | **30** 1 50.8 | - 5 36.6 | -0.4646 | .5108 | -.2249 | +15 | -73 |
| B. A. C. 4722 | 6 | 2.20 | 18.2 | 17 37.6 | 4 8.2 | - 3 23.3 | +1.0894 | .5116 | .2219 | +73 | +18 |
| B. A. C. 4739 | 6½ | +2.22 | -18.4 | -18 8.7 | 5 45.6 | - 1 48.8 | +1.2951 | .5122 | -.2197 | +72 | +37 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### JULY.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. $\Delta\alpha$ | $\Delta\delta$ | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | $Y$ | $x'$ | $y'$ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| B. A. C. 4923 | 6 | +2.50 | -18.7 | -20 51.6 | **1** 0 57.9 | - 9 10.2 | +0.3092 | .5202 | -.1904 | +50 | -28 |
| B. A. C. 5023 | 6 | 2.62 | 18.4 | 21 56.7 | 10 13.4 | - 0 12.1 | -0.1916 | .5245 | .1742 | +22 | -56 |
| 42 Libræ | 5½ | 2.80 | 17.8 | 23 25.1 | 21 37.1 | +10 49.8 | -0.4370 | .5299 | .1524 | + 7 | -72 |
| B. A. C. 5197 | 6 | 2.85 | 17.8 | 24 19.8 | **2** 0 13.5 | -10 38.9 | +0.1749 | .5311 | .1471 | +38 | -35 |
| *b* Scorpii | 5 | 2.90 | 17.9 | 25 22.6 | 2 37.1 | - 8 20.0 | +0.9838 | .5323 | .1422 | +65 | +13 |
| $A^2$ Scorpii | 5 | 2.92 | 17.8 | 24 57.6 | 3 51.8 | - 7 7.7 | +0.3484 | .5328 | .1397 | +47 | -25 |
| B. A. C. 5253 | 6 | +2.91 | -17.5 | -24 10.0 | 4 0.9 | - 6 58.9 | -0.5478 | .5329 | -.1392 | 0 | -82 |
| B. A. C. 5254 | 6 | 2.90 | 17.3 | 23 36.7 | 4 2.6 | - 6 57.3 | -1.1631 | .5329 | .1392 | -39 | -90 |
| B. A. C. 5255 | 6 | 2.92 | 17.8 | 25 2.7 | 4 8.4 | - 6 51.7 | +0.4038 | .5329 | .1390 | +49 | -22 |
| 3 Scorpii | 6 | 2.92 | 17.6 | 24 52.9 | 4 21.3 | - 6 39.2 | +0.1929 | .5330 | .1386 | +38 | -34 |
| 4 Scorpii | 6 | 2.95 | 17.9 | 25 54.3 | 4 43.7 | - 6 17.6 | +1.2706 | .5332 | .1377 | +64 | +44 |
| B. A. C. 5286 | 6½ | 2.92 | 17.3 | 24 29.1 | 6 12.0 | - 4 52.1 | -0.4958 | .5338 | .1348 | + 2 | -77 |
| π Scorpii | 3 | +2.95 | -17.7 | -25 45.6 | 6 17.7 | - 2 48.3 | +0.8972 | .5338 | -.1346 | +64 | + 7 |
| B. A. C. 5314 | 6 | 2.98 | 17.5 | 25 31.4 | 8 23.9 | - 0 46.3 | +0.3583 | .5348 | .1299 | +46 | -25 |
| B. A. C. 5347 | 5 | 3.01 | 17.4 | 25 59.9 | 10 35.9 | + 1 21.4 | +0.6017 | .5357 | .1254 | +59 | -11 |
| σ Scorpii | 3½ | 3.07 | 16.4 | 25 17.9 | 16 39.3 | + 7 12.7 | -0.8898 | .5383 | .1118 | -22 | -90 |
| α Scorpii | 1½ | 3.15 | 16.1 | 26 9.6 | 20 24.3 | +10 50.0 | -0.3410 | .5397 | .1034 | + 7 | -66 |
| B. A. C. 5800 | 6½ | 3.37 | 13.2 | 26 50.3 | **3** 16 40.4 | + 6 24.8 | -1.1967 | .5459 | .0544 | -51 | -90 |
| 43 Ophiuchi | 6 | +3.45 | -12.6 | -28 1.4 | 20 43.7 | +10 19.8 | -0.0805 | .5467 | -.0442 | +14 | -49 |
| 3 Sagittarii | 5 | 3.52 | 10.6 | 27 47.1 | **4** 7 32.2 | - 3 14.1 | -0.6767 | .5480 | .0167 | -19 | -90 |
| B. A. C. 6063 | 6½ | 3.59 | 10.0 | 28 ·2.8 | 11 36.5 | + 0 41.7 | -0.4318 | .5482 | .0062 | - 7 | -73 |
| B. A. C. 6072 | 6½ | 3.61 | 9.9 | 28 44.5 | 12 27.2 | + 1 30.7 | +0.3353 | .5482 | -.0042 | +33 | -25 |
| B. A. C. 6120 | 6½ | 3.63 | 9.1 | 28 22.3 | 16 5.4 | + 5 1.3 | -0.0741 | .5481 | +.0050 | +11 | -49 |
| B. A. C. 6127 | 5 | 3.63 | 9.0 | 28 23.3 | 16 39.9 | + 5 34.6 | +0.0398 | .5481 | .0066 | +17 | -42 |
| B. A. C. 6190 | 6½ | +3.66 | - 8.3 | -28 41.6 | 20 48.8 | + 9 34.8 | +0.3347 | .5479 | +.0173 | +34 | -25 |
| B. A. C. 6191 | 6½ | 3.66 | 8.3 | 28 19.6 | 20 49.2 | + 9 35.2 | -0.0720 | .5479 | .0173 | +12 | -49 |
| B A. C. 6220 | 6½ | 3.72 | 7.8 | 28 29.4 | 22 52.7 | +11 34.5 | +0.1498 | .5478 | .0224 | +24 | -36 |
| φ Sagittarii | 3½ | 3.67 | 5.4 | 27 7.0 | **5** 9 31.1 | - 2 9.2 | -0.9931 | .5461 | .0495 | -35 | -90 |
| τ Sagittarii | 3½ | 3.72 | 3.4 | 27 51.0 | 19 7.7 | + 7 7.7 | +0.4104 | .5435 | .0731 | +43 | -21 |
| B. A. C. 6666 | 6 | 3.72 | - 1.2 | 27 14.3 | **6** 5 37.7 | - 6 43.6 | +0.6281 | .5399 | .0979 | +59 | - 9 |
| ω Sagittarii | 5 | +3.68 | + 1.5 | -26 37.6 | 17 42.9 | + 4 55.6 | +1.2957 | .5347 | +.1251 | +64 | +52 |
| B. A. C. 7049 | 6 | 3.53 | 4.5 | 22 48.0 | **7** 9 52.7 | - 3 23.9 | -0.6570 | .5268 | .1579 | - 4 | -90 |
| 17 Capricorni | 6 | 3.46 | 6.0 | 21 57.7 | 18 0.9 | + 4 28.9 | -0.2379 | .5225 | .1730 | +20 | -58 |
| B. A. C. 7197 | 6 | 3.49 | 6.3 | 23 11.1 | 19 4.2 | + 5 20.1 | +1.2996 | .5220 | .1748 | +67 | +44 |
| η Capricorni | 5½ | 3.38 | 7.6 | 20 20.5 | **8** 3 6.0 | -10 43.0 | -0.3860 | .5178 | .1884 | +14 | -68 |
| 27 Capricorni | 6 | 3.38 | 8.0 | 21 3.0 | 5 39.5 | - 8 14.1 | +0.8839 | .5165 | .1925 | +69 | + 4 |
| 30 Capricorni | 6 | +3.28 | + 8.4 | -18 30.0 | 9 57.4 | - 4 4.1 | -1.0892 | .5144 | +.1993 | -25 | -90 |
| γ Capricorni | 3½ | 3.18 | 10.1 | 17 13.1 | 21 18.2 | + 6 56.4 | -0.1452 | .5089 | .2154 | +30 | -53 |
| δ Capricorni | 3 | 3.13 | 10.5 | 16 41.2 | **9** 0 54.7 | +10 26.6 | +0.0550 | .5072 | .2200 | +40 | -42 |
| ι Aquarii | 4 | 3.01 | 11.5 | 14 28.0 | 11 8.2 | - 3 37.8 | -0.0673 | .5031 | .2322 | +36 | -48 |
| 42 Aquarii | 6 | 2.95 | 12.2 | 13 26.8 | 16 39.0 | + 1 43.5 | +0.1106 | .5011 | .2380 | +46 | -39 |
| 45 Aquarii | 6 | 2.95 | 12.4 | 13 53.3 | 17 49.1 | + 2 51.6 | +0.9093 | .5007 | .2391 | +76 | + 4 |
| σ Aquarii | 4½ | +2.86 | +12.6 | -11 18.5 | **10** 0 4.7 | + 8 56.4 | -0.4312 | .4987 | +.2450 | +20 | -70 |
| 58 Aquarii | 6 | 2.85 | 12.7 | 11 32.2 | 0 37.8 | + 9 28.6 | -0.0461 | .4985 | .2455 | +39 | -47 |
| 64 Aquarii | 6½ | 2.80 | 13.1 | 10 40.1 | 4 43.6 | -10 32.6 | +0.0206 | .4977 | .2491 | +43 | -44 |
| SATURN | | | | 10 19.2 | 8 36.9 | - 6 45.8 | +0.6157 | .4983 | .2527 | +77 | -13 |
| λ Aquarii | 4 | 2.71 | 13.3 | 8 14.1 | 11 57.4 | - 3 31.0 | -0.8061 | .4961 | .2545 | + 1 | -90 |
| 78 Aquarii | 6 | 2.70 | 13.4 | 7 51.5 | 12 1.3 | - 3 29.6 | -0.9434 | .4958 | .2552 | - 7 | -90 |
| 81 Aquarii | 6 | +2.67 | +13.8 | - 7 43.4 | 16 43.6 | + 1 7.2 | -0.1398 | .4954 | +.2577 | +36 | -52 |
| 82 Aquarii | 6 | 2.64 | 13.6 | 7 14.1 | 17 21.2 | + 1 43.8 | -0.5071 | .4954 | .2581 | +17 | -75 |
| $h^1$ Aquarii | 5½ | 2.65 | 14.2 | 8 21.5 | 18 45.5 | + 3 5.7 | +1.0740 | .4952 | .2589 | +82 | +14 |
| $h^2$ Aquarii | 7 | 2.65 | 14.2 | 8 25.1 | 18 51.1 | + 3 11.1 | +1.1617 | .4952 | .2590 | +82 | +20 |
| $h^3$ Aquarii | 7 | 2.65 | 14.3 | 8 36.0 | 19 9.4 | + 3 28.9 | +1.4381 | .4952 | .2592 | +82 | +61 |
| $h^4$ Aquarii | 7½ | +2.64 | +14.3 | - 8 21.4 | 19 52.8 | + 4 11.1 | +1.3614 | .4951 | +.2596 | +82 | +40 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### JULY.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle *H* | *Y* | *x′* | *y′* | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| φ Aquarii | 4½ | +2.59 | +14.2 | − 6 42.8 | **10** 23 45.5 | + 7 57.3 | +0.5920 | .4947 | +.2617 | +79 | −14 |
| 96 Aquarii | 5½ | 2.55 | 14.3 | 5 47.8 | **11** 2 30.8 | +10 38.0 | +0.3244 | .4946 | .2631 | +62 | −28 |
| B. A. C. 8134 | 6½ | 2.54 | 14.2 | 5 20.8 | 3 36.1 | +11 41.4 | +0.1233 | .4946 | .2636 | +51 | −38 |
| B. A. C. 8184 | 5½ | 2.49 | 14.6 | 5 12.3 | 8 2.8 | − 7 59.3 | +1.1416 | .4946 | .2655 | +85 | +18 |
| B. A. C. 8311 | 6½ | 2.31 | 14.4 | − 0 34.6 | 21 44.7 | + 5 19.6 | −0.1648 | .4960 | .2694 | +36 | −53 |
| 60 Piscium | 6 | 2.00 | 14.1 | + 6 4.1 | **13** 1 37.8 | + 8 24.7 | +0.2815 | .5058 | .2674 | +60 | −29 |
| 62 Piscium | 6 | +1.99 | +13.9 | + 6 37.6 | 2 5.0 | + 8 51.1 | −0.1873 | .5060 | +.2672 | +35 | −54 |
| δ Piscium | 4½ | 1.99 | 13.8 | 6 54.8 | 2 17.2 | + 9 2.9 | −0.4355 | .5062 | .2672 | +23 | −68 |
| ε Piscium | 4 | 1.92 | 14.2 | 7 13.5 | 9 36.7 | − 7 50.6 | +1.1803 | .5102 | .2642 | +90 | +23 |
| π Piscium | 6 | 1.74 | 13.3 | 11 30.6 | **14** 2 32.7 | + 8 34.2 | +1.0745 | .5225 | .2527 | +90 | +18 |
| 104 Piscium | 6½ | 1.72 | 12.5 | 13 39.6 | 3 33.5 | + 9 33.1 | −0.9057 | .5233 | .2519 | − 4 | −77 |
| 26 Arietis | 6 | 1.49 | 11.4 | 19 18.4 | **15** 3 18.3 | + 8 30.7 | −1.0454 | .5457 | .2236 | −15 | −71 |
| 27 Arietis | 6 | +1.50 | +12.1 | +17 9.5 | 3 27 4 | + 8 39.4 | +1.1901 | .5459 | +.2233 | +90 | +32 |
| B. A. C. 782 | 6½ | 1.48 | 11.7 | 18 20.2 | 4 38.0 | + 9 47.6 | +0.2445 | .5472 | .2214 | +58 | −24 |
| μ Arietis | 5½ | 1.45 | 11.6 | 19 29.1 | 8 27.7 | −10 30.8 | −0.0947 | .5512 | .2152 | +39 | −40 |
| 47 Arietis | 6 | 1.38 | 11.4 | 20 10.4 | 15 11.7 | − 4 1.3 | +0.6114 | .5586 | .2032 | +86 | − 3 |
| ε Arietis | 4½ | 1.38 | 11.2 | 20 50.8 | 15 40.5 | − 3 33.5 | +0.0243 | .5591 | .2023 | +46 | −32 |
| 66 Arietis | 6½ | 1.27 | 10.7 | 22 22.7 | **16** 3 44.1 | + 8 3.1 | +0.7582 | .5726 | .1767 | +90 | + 9 |
| 7 Tauri | 6 | +1.26 | +10.1 | +24 3.0 | 6 7.0 | +10 20.5 | −0.5138 | .5752 | +.1709 | +16 | −57 |
| 9 Tauri | 6 | 1.24 | 10.5 | 22 48.1 | 7 9.0 | +11 11.0 | +0.9183 | .5763 | .1685 | +90 | +19 |
| 11 Tauri | 6 | 1.23 | 10.0 | 24 55.8 | 8 37.3 | −11 15.1 | −0.9784 | .5780 | .1649 | −12 | −65 |
| *g* Pleiadum | 5½ | 1.22 | 10.2 | 23 54.0 | 10 14.1 | − 9 42.2 | +0.3202 | .5797 | .1609 | +64 | −13 |
| *b* Pleiadum | 4 | 1.23 | 10.3 | 23 43.5 | 10 16.0 | − 9 40.3 | +0.5020 | .5797 | .1609 | +78 | − 3 |
| *m* Pleiadum | 7 | 1.23 | 10.1 | 24 27.0 | 10 22.0 | − 9 34.6 | −0.2120 | .5798 | .1606 | +33 | −40 |
| *e* Pleiadum | 5 | +1.23 | +10.2 | +24 4.7 | 10 23.4 | − 9 33.2 | +0.1654 | .5798 | +.1606 | +54 | −20 |
| *c* Pleiadum | 5 | 1.23 | 10.2 | 23 58.9 | 10 38.2 | − 9 19.0 | +0.3030 | .5802 | .1598 | +63 | −13 |
| *d* Pleiadum | 5 | 1.23 | 10.3 | 23 33.8 | 10 50.5 | − 9 7.2 | +0.7560 | .5804 | .1593 | +90 | +11 |
| η Tauri | 3 | 1.22 | 10.3 | 23 43.4 | 11 17.6 | − 8 41.1 | +0.6673 | .5808 | .1583 | +90 | + 6 |
| *f* Pleiadum | 4 | 1.22 | 10.2 | 23 40.5 | 11 57.1 | − 8 3.2 | +0.8185 | .5816 | .1564 | +90 | +14 |
| *h* Pleiadum | 5½ | 1.22 | 10.2 | 23 45.5 | 11 57.6 | − 8 2.7 | +0.7360 | .5816 | .1564 | +90 | +10 |
| B. A. C. 1192 | 6 | +1.21 | + 9.9 | +25 12.3 | 12 22.5 | − 7 38.8 | −0.6525 | .5820 | +.1554 | + 8 | −63 |
| *p* Tauri | 6 | 1.16 | 9.5 | 26 9.5 | 20 16.5 | − 0 4.0 | −0.4617 | .5903 | .1340 | +19 | −51 |
| φ Tauri | 5½ | 1.14 | 9.2 | 27 3.3 | 23 51.4 | + 3 22.1 | −0.8949 | .5940 | .1235 | − 8 | −63 |
| $\chi^1$ Tauri | 5½ | 1.11 | 9.6 | 25 20.2 | **17** 0 43.6 | + 4 12.1 | +0.9255 | .5948 | .1208 | +90 | +25 |
| $\chi^2$ Tauri | 8½ | 1.11 | 9.6 | 25 20.5 | 0 43.9 | + 4 12.4 | +0.9305 | .5948 | .1208 | +90 | +25 |
| B. A. C. 1648 | 6½ | 1.00 | 8.7 | 27 49.9 | 21 58.2 | + 0 32.0 | +0.2921 | .6116 | .0515 | +63 | − 3 |
| β Tauri | 2 | +0.99 | + 8.5 | +28 30.2 | 23 50.3 | + 2 19.1 | −0.2812 | .6128 | +.0447 | +29 | −33 |
| B. A. C. 1709 | 6½ | 0.99 | 8.3 | 29 5.3 | **18** 1 1.5 | + 3 27.2 | −0.8078 | .6136 | .0370 | − 3 | −61 |
| B. A. C. 1746 | 6½ | 0.97 | 8.6 | 27 34.9 | 3 16.3 | + 5 36.0 | +0.7598 | .6143 | .0327 | +90 | +23 |
| B. A. C. 1772 | 6 | 0.98 | 8.1 | 29 8.7 | 4 25.7 | + 6 42.4 | −0.7452 | .6148 | .0283 | + 1 | −61 |
| 136 Tauri | 5 | 0.95 | 8.3 | 27 35.0 | 9 23.8 | +11 27.1 | +0.8898 | .6165 | .0106 | +90 | +32 |
| B. A. C. 1882 | 6½ | 0.95 | 8.0 | 28 55.4 | 10 30.1 | −11 29.5 | −0.4202 | .6169 | +.0064 | +21 | −38 |
| κ Aurigæ | 4½ | +0.94 | + 7.7 | +29 32.6 | 17 4.8 | − 5 12.6 | −0.0852 | .6178 | −.0178 | +40 | −20 |
| 34 Leonis | 6 | 0.98 | 0.0 | 13 57.9 | **22** 11 23.4 | + 9 23.4 | −0.0709 | .5510 | .2589 | +41 | −43 |
| 37 Leonis | 6 | 1.00 | − 0.1 | 14 20.7 | 13 37.0 | +11 32.4 | −1.0301 | .5490 | .2615 | −12 | −76 |
| *c* Leonis | 5 | 1.06 | 3.6 | 6 46.0 | **23** 9 49.4 | + 7 3.9 | +1.1146 | .5324 | .2777 | +90 | +18 |
| χ Leonis | 5 | 1.09 | 3.5 | 8 0.3 | 11 50.9 | + 9 1.4 | −0.6992 | .5308 | .2784 | + 9 | −82 |
| τ Leonis | 5 | 1.13 | 5.7 | 3 32.2 | 22 49.6 | − 4 21.1 | +0.7593 | .5237 | .2816 | +90 | − 5 |
| 89 Leonis | 6 | +1.16 | − 5.9 | + 3 44.8 | **24** 1 58.0 | − 1 18.6 | −0.3390 | .5222 | −.2818 | +27 | −63 |
| β Virginis | 3½ | 1.22 | 6.9 | 2 27.7 | 9 56.1 | + 6 24.5 | −1.2729 | .5183 | .2817 | −29 | −88 |
| B. A. C. 4043 | 6½ | 1.24 | 7.5 | + 1 13.1 | 14 8.5 | +10 29.2 | −1.1825 | .5165 | .2810 | −21 | −89 |
| B. A. C. 4200 | 6 | 1.33 | 10.1 | − 3 55.9 | **25** 4 36.2 | + 0 30.4 | +0.1054 | .5121 | .2759 | +50 | −39 |
| B. A. C. 4225 | 6½ | 1.35 | 10.4 | 4 22.3 | 6 30.9 | + 2 21.6 | +0.0358 | .5117 | .2749 | +46 | −43 |
| *f* Virginis | 6 | +1.37 | −10.8 | − 5 9.1 | 9 7.3 | + 4 53.4 | +0.1338 | .5111 | −.2734 | +51 | −38 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| **JULY.** | | | | | | | | | | | |
| 28 Virginis | 6 | +1.39 | -11.6 | − 6 49.3 | **25** 11 44.3 | + 7 25.6 | +1.1644 | .5106 | -.2718 | +83 | +20 |
| B. A. C. 4294 | 6½ | 1.44 | 11.4 | 5 37.5 | 14 35.1 | +10 11.2 | −0.8572 | .5104 | .2700 | − 1 | −90 |
| *g* Virginis | 6 | 1.52 | 13.4 | 10 4.8 | **26** 0 54.8 | − 3 47.5 | +1.0718 | .5099 | .2620 | +80 | +14 |
| B. A. C. 4394 | 6 | 1.54 | 13.9 | 8 19.4 | 1 15.5 | − 3 27.5 | −0.8702 | .5099 | .2616 | − 3 | −90 |
| 50 Virginis | 6 | 1.54 | 13.3 | 9 40.3 | 1 51.9 | − 2 52.2 | +0.3926 | .5099 | .2611 | +64 | −25 |
| 58 Virginis | 6 | 1.58 | 13.6 | 9 53.8 | 5 47.2 | + 0 56.1 | −0.3872 | .5100 | .2575 | +23 | −67 |
| α Virginis | 1 | +1.61 | −14.0 | −10 31.0 | 9 42.7 | + 4 44.5 | −0.7345 | .5101 | −.2537 | + 4 | −90 |
| *i* Virginis | 6 | 1.62 | 14.6 | 12 4.0 | 10 28.8 | + 5 29.3 | +0.7122 | .5102 | .2529 | +78 | − 8 |
| B. A. C. 4531 | 6 | 1.67 | 15.0 | 12 34.9 | 14 30.4 | + 9 23.6 | +0.2509 | .5107 | .2487 | +54 | −32 |
| B. A. C. 4700 | 6 | 1.91 | 16.4 | 15 43.2 | **27** 8 40.3 | + 3 0.5 | −0.7176 | .5145 | .2260 | + 1 | −90 |
| B. A. C. 4722 | 6 | 1.93 | 17.1 | 17 37.6 | 10 55.4 | + 5 11.4 | +0.8247 | .5151 | .2228 | +73 | 0 |
| B. A. C. 4739 | 6½ | 1.95 | 17.3 | 18 8.7 | 12 31.2 | + 6 44.3 | +1.0297 | .5155 | .2204 | +72 | +13 |
| B. A. C. 4923 | 6 | +2.25 | −18.0 | −20 51.6 | **28** 7 27.8 | + 1 5.6 | +0.0700 | .5221 | −.1903 | +37 | −41 |
| B. A. C. 5023 | 6 | 2.39 | 18.0 | 21 56.7 | 16 37.7 | + 9 58.1 | −0.4171 | .5257 | .1736 | +11 | −70 |
| 42 Libræ | 5½ | 2.59 | 17.9 | 23 25.1 | **29** 3 55.8 | − 3 5.8 | −0.6479 | .5304 | .1514 | − 4 | −90 |
| B. A. C. 5197 | 6 | 2.64 | 18.0 | 24 19.8 | 6 31.2 | − 0 35.5 | −0.0350 | .5315 | .1460 | +27 | −47 |
| *b* Scorpii | 5 | 2.70 | 18.2 | 25 22.7 | 8 53.9 | + 1 42.5 | +0.7736 | .5325 | .1410 | +65 | − 1 |
| A² Scorpii | 5 | 2.71 | 18.0 | 24 57.6 | 10 8.2 | + 2 54.4 | +0.1424 | .5330 | .1384 | +35 | −37 |
| B. A. C. 5253 | 6 | +2.71 | −17.6 | −24 10.0 | 10 17.3 | + 3 3.2 | −0.7499 | .5330 | −.1382 | −11 | −90 |
| B. A. C. 5255 | 6 | 2.71 | 18.0 | 25 2.7 | 10 24.7 | + 3 10.3 | +0.1982 | .5330 | .1380 | +38 | −34 |
| 3 Scorpii | 6 | 2.72 | 17.9 | 24 52.9 | 10 37.6 | + 3 22.8 | −0.0116 | .5332 | .1374 | +27 | −45 |
| 4 Scorpii | 6 | 2.75 | 18.2 | 25 54.3 | 10 59.8 | + 3 44.3 | +1.0624 | .5333 | .1367 | +64 | +20 |
| B. A. C. 5286 | 6½ | 2.74 | 17.6 | 24 29.1 | 12 27.7 | + 5 9.3 | −0.6952 | .5339 | .1335 | − 9 | −90 |
| π Scorpii | 3 | 2.76 | 18.0 | 25 45.6 | 12 33.3 | + 5 14.7 | +0.6928 | .5339 | .1332 | −64 | − 6 |
| B. A. C. 5314 | 6 | +2.79 | −17.7 | −25 31.4 | 14 38.9 | + 7 16.2 | +0.1585 | .5346 | −.1287 | +35 | −36 |
| B. A. C. 5347 | 5 | 2.83 | 17.6 | 25 59.9 | 16 50.2 | + 9 23.1 | +0.4043 | .5355 | .1239 | +48 | −22 |
| σ Scorpii | 3½ | 2.91 | 16.8 | 25 17.9 | 22 52.2 | − 8 46.9 | −1.0740 | .5377 | .1103 | −35 | −90 |
| α Scorpii | 1½ | 2.99 | 16.7 | 26 9.6 | **30** 2 36.5 | − 5 10.2 | −0.5212 | .5391 | .1018 | − 3 | −80 |
| τ Scorpii | 3½ | 3.07 | 16.8 | 27 57.7 | 5 30.7 | − 2 21.8 | +1.1817 | .5400 | .0950 | +62 | +33 |
| B. A. C. 5603 | 6½ | 3.16 | 16.4 | 28 16.8 | 9 38.5 | + 1 37.5 | +1.1639 | .5413 | .0851 | +62 | +31 |
| 43 Ophiuchi | 6 | +3.40 | −13.5 | −28 1.4 | **31** 2 53.7 | − 5 42.8 | −0.2235 | .5454 | −.0426 | + 7 | −58 |
| 3 Sagittarii | 5 | 3.52 | 11.6 | 27 47.1 | 13 42.2 | + 4 43.3 | −0.8015 | .5468 | .0152 | −26 | −90 |
| B. A. C. 6063 | 6½ | 3.61 | 10.9 | 28 2.9 | 17 46.5 | + 8 39.2 | −0.5503 | .5469 | .0047 | −14 | −84 |
| B. A. C. 6072 | 6½ | 3.65 | 10.8 | 28 44.5 | 18 46.1 | + 9 37.0 | +0.2174 | .5469 | −.0022 | +26 | −32 |
| γ¹ Sagittarii | 4 | 3.70 | 10.6 | 29 35.2 | 21 26.2 | −11 48.9 | +1.1580 | .5470 | +.0048 | +61 | +32 |
| B. A. C. 6120 | 6½ | 3.68 | 10.1 | 28 22.4 | 22 15.3 | −11 1.5 | −0.1850 | .5470 | .0068 | + 5 | −56 |
| B. A. C. 6127 | 5 | +3.68 | −10.0 | −28 28.3 | 22 50.0 | −10 27.9 | −0.0706 | .5469 | +.0084 | +11 | −49 |
| **AUGUST.** | | | | | | | | | | | |
| B. A. C. 6190 | 6½ | +3.74 | − 9.2 | −28 41.6 | **1** 2 58.9 | − 6 27.7 | +0.2311 | .5466 | +.0189 | +28 | −31 |
| B. A. C. 6191 | 6½ | 3.72 | 9.2 | 28 19.6 | 2 59.3 | − 6 27.3 | −0.1749 | .5466 | .0189 | + 7 | −55 |
| B. A. C. 6220 | 6½ | 3.79 | 8.7 | 28 29.4 | 5 2.9 | − 4 27.9 | +0.0500 | .5465 | .0242 | +20 | −42 |
| φ Sagittarii | 3½ | +3.81 | − 6.2 | −27 7.1 | 15 41.4 | + 5 48.5 | −1.0735 | .5450 | +.0509 | −41 | −90 |
| τ Sagittarii | 3½ | 3.91 | 4.3 | 27 51.0 | **2** 1 17.9 | − 8 54.6 | +0.3455 | .5428 | .0746 | +40 | −25 |
| B. A. C. 6666 | 6 | 3.96 | − 1.7 | 27 14.3 | 11 47.6 | + 1 13.8 | +0.5818 | .5397 | .0997 | +56 | −12 |
| ω Sagittarii | 5 | 4.00 | + 0.9 | 26 37.6 | 23 51.7 | −11 6.2 | +1.2703 | .5349 | .1268 | +64 | +45 |
| B. A. C. 7049 | 6 | 3.92 | 4.9 | 22 48.0 | **3** 15 59.2 | + 4 30.0 | −0.6497 | .5275 | .1601 | − 3 | −90 |
| 17 Capricorni | 6 | 3.88 | 6 6 | 21 57.7 | **4** 0 5.7 | −11 38.9 | −0.2163 | .5236 | .1751 | +21 | −57 |
| B. A. C. 7197 | 6 | +3.92 | + 6.8 | −22 11.1 | 1 7.7 | −10 38.9 | +1.3204 | .5230 | +.1770 | +68 | +49 |
| η Capricorni | 5½ | 3.82 | 8.6 | 20 20.5 | 9 8.5 | − 2 52.9 | −0.3470 | .5192 | .1909 | +16 | −65 |
| 27 Capricorni | 6 | 3.85 | 9.0 | 21 3.0 | 11 41.4 | − 0 24.7 | +0.9251 | .5180 | .1950 | +69 | + 7 |
| 30 Capricorni | 6 | 3.76 | 9.9 | 18 30.0 | 15 58.1 | + 3 44.1 | −1.0359 | .5159 | .2018 | −21 | −90 |
| γ Capricorni | 3½ | 3.71 | 11.9 | 17 13.1 | **5** 3 15.5 | − 9 18.9 | −0.0723 | .5107 | .2180 | +33 | −48 |
| δ Capricorni | 3 | +3.68 | +12.5 | −16 41.1 | 6 50.9 | − 5 49.9 | +0.1341 | .5092 | +.2227 | +45 | −38 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### AUGUST.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| ι Aquarii | 4 | +3.59 | +14.1 | -14 28.0 | **5** 17 1.1 | + 4 2.4 | +0.0301 | .5050 | +.2349 | +41 | -43 |
| 42 Aquarii | 6 | 3 55 | 14.8 | 13 26.7 | 22 30.1 | + 9 22.0 | +0.2173 | .5031 | .2406 | +52 | -33 |
| 45 Aquarii | 6 | 3.55 | 15.1 | 13 55.2 | 23 39.9 | +10 29.8 | +1.0167 | .5027 | .2418 | +76 | +11 |
| σ Aquarii | 4½ | 3.47 | 15.8 | 11 18.4 | **6** 5 53.5 | - 7 27.3 | -0.3113 | .5009 | .2476 | +26 | -62 |
| 58 Aquarii | 6 | 3.47 | 15.8 | 11 32.1 | 6 26.5 | - 6 55.3 | +0.0742 | .5007 | .2482 | +45 | -41 |
| 64 Aquarii | 6½ | 3.44 | 16.3 | 10 40.0 | 10 31.2 | - 2 57.5 | +0.1476 | .4996 | .2517 | +50 | -37 |
| SATURN | | | | -10 56.3 | 11 30.2 | - 2 0.2 | +0.6894 | .5025 | +.2506 | +79 | - 9 |
| λ Aquarii | 4 | +3.35 | +17.0 | 8 14.1 | 17 43.0 | + 4 2.1 | -0.6676 | .4981 | .2571 | + 9 | -89 |
| 78 Aquarii | 6 | 3.34 | 17.0 | 7 51.5 | 18 46.7 | + 5 3.9 | -0.8026 | .4979 | .2577 | + 1 | -90 |
| 81 Aquarii | 6 | 3.31 | 17.4 | 7 43.3 | 22 28.1 | + 8 39.1 | +0.0060 | .4973 | .2601 | +43 | -45 |
| 82 Aquarii | 6 | 3.31 | 17.6 | 7 14.1 | 23 5.5 | + 9 15.4 | -0.3606 | .4971 | .2605 | +25 | -65 |
| $h^1$ Aquarii | 5½ | 3.32 | 17.8 | 8 21.5 | **7** 0 29.6 | +10 37.1 | +1.2226 | .4969 | .2613 | +82 | +25 |
| $h^2$ Aquarii | 7 | +3.32 | +17.8 | - 8 25.0 | 0 35.1 | +10 42.5 | +1.3107 | .4969 | +.2613 | +82 | +34 |
| φ Aquarii | 4½ | 3.27 | 18.2 | 6 42.7 | 5 28.6 | - 8 32.2 | +0.7480 | .4964 | .2639 | +81 | - 6 |
| 96 Aquarii | 5½ | 3.23 | 18.3 | 5 47.8 | 8 13.5 | - 5 51.9 | +0.4842 | .4962 | .2653 | +72 | -20 |
| B. A. C. 8134 | 6½ | 3.22 | 18.4 | 5 20.7 | 9 18.5 | - 4 48.7 | +0.2842 | .4961 | .2657 | +60 | -30 |
| B. A. C. 8184 | 5½ | 3.19 | 18.9 | 5 12.2 | 13 43.9 | - 0 30.8 | +1.3092 | .4960 | .2674 | +85 | +33 |
| B. A. C. 8311 | 6½ | 3.04 | 19.1 | - 0 34.5 | **8** 3 26.2 | -11 11.6 | +0.0170 | .4968 | .2708 | +46 | -44 |
| 60 Piscium | 6 | +2.79 | +19.2 | + 6 4.2 | **9** 7 26.2 | - 7 59.4 | +0.4860 | .5045 | +.2673 | +74 | -20 |
| 62 Piscium | 6 | 2.79 | 19.1 | 6 37.7 | 7 53.6 | - 7 32.9 | +0.0147 | .5046 | .2671 | +46 | -43 |
| δ Piscium | 4½ | 2.79 | 19.1 | 6 54.9 | 8 5.9 | - 7 20.9 | -0.2350 | .5047 | .2670 | +33 | -56 |
| ε Piscium | 4 | 2.73 | 19.4 | 7 13.6 | 15 29.3 | - 0 10.6 | +1.3941 | .5082 | .2638 | +90 | +47 |
| π Piscium | 6 | 2.59 | 18.5 | 11 30.7 | **10** 8 38.1 | - 7 33.0 | +1.2918 | .5189 | .2512 | +90 | +36 |
| 104 Piscium | 6½ | 2.59 | 17.9 | 13 39.7 | 9 39.8 | - 6 33.3 | -0.7060 | .5195 | .2503 | + 8 | -77 |
| 26 Arietis | 6 | +2.39 | +16.1 | +19 18.5 | **11** 9 51.9 | - 7 8.1 | -0.8582 | .5394 | +.2207 | - 2 | -71 |
| B. A. C. 782 | 6½ | 2.39 | 16.4 | 18 20.2 | 11 13.5 | - 5 49.3 | +0.4467 | .5407 | .2185 | +72 | -14 |
| μ Arietis | 5½ | 2.35 | 15.9 | 19 29.2 | 15 8.5 | - 2 2.4 | +0.1008 | .5444 | .2122 | +50 | -30 |
| 47 Arietis | 6 | 2.30 | 15.5 | 20 10.5 | 22 2.6 | + 4 37.2 | +0.8119 | .5511 | .2000 | +90 | + 9 |
| ε Arietis | 4½ | 2.30 | 15.3 | 20 50.8 | 22 32.2 | + 5 5.7 | +0.2167 | .5516 | .1991 | +57 | -22 |
| 64 Arietis | 6 | 2.23 | 13.7 | 24 17.2 | **12** 9 10.0 | - 8 39.5 | -1.3125 | .5622 | .1773 | -48 | -66 |
| 66 Arietis | 6½ | +2.20 | +14.3 | +22 22.7 | 10 55·6 | - 6 57.9 | +0.9506 | .5640 | +.1733 | +90 | +21 |
| 7 Tauri | 6 | 2.19 | 13.6 | 24 3.0 | 13 22.7 | - 4 36.3 | -0.3421 | .5665 | .1677 | +26 | -47 |
| 9 Tauri | 6 | 2.17 | 14.0 | 22 48.2 | 14 26.5 | - 3 34.9 | +1.1105 | .5675 | .1652 | +90 | +33 |
| 11 Tauri | 6 | 2.18 | 13.1 | 24 55.8 | 15 57.4 | - 2 7.4 | -0.8160 | .5690 | .1618 | - 1 | -65 |
| g Pleiadum | 5½ | 2.15 | 13.5 | 23 54.1 | 17 37.1 | - 0 31.5 | +0.5007 | .5706 | .1576 | +78 | - 3 |
| b Pleiadum | 4 | 2.15 | 13.5 | 23 43.5 | 17 39.0 | - 0 29.7 | +0.6850 | .5706 | .1575 | +90 | + 7 |
| m Pleiadum | 7 | +2.15 | +13.2 | +24 27.1 | 17 45.1 | - 0 23.8 | +0.0213 | .5707 | +.1573 | +46 | -27 |
| e Pleiadum | 5 | 2.15 | 13.4 | 24 4.8 | 17 46.7 | - 0 22.3 | +0.3430 | .5707 | .1572 | +66 | -11 |
| c Pleiadum | 5 | 2.15 | 13.4 | 23 58.9 | 18 1.8 | - 0 7.8 | +0.4827 | .5710 | .1566 | +76 | - 4 |
| d Pleiadum | 5 | 2.14 | 13.5 | 23 33.8 | 18 14.5 | + 0 4.4 | +0.9423 | .5712 | .1561 | +90 | +22 |
| η Tauri | 3 | 2.14 | 13.4 | 23 43.4 | 18 42.4 | + 0 31.2 | +0.8517 | .5716 | .1551 | +90 | +16 |
| f Pleiadum | 4 | 2.13 | 13.5 | 23 40.6 | 19 23.2 | + 1 10.6 | +1.0044 | .5723 | .1534 | +90 | +26 |
| h Pleiadum | 5½ | +2.13 | +13.4 | +23 45.6 | 19 23.7 | + 1 11.1 | +0.9207 | .5723 | +.1534 | +90 | +21 |
| B. A. C. 1192 | 6 | 2.13 | 12.8 | 25 12.4 | 19 49.3 | + 1 35.7 | -0.4891 | .5728 | .1521 | +18 | -54 |
| p Tauri | 6 | 2.08 | 12.1 | 26 9.6 | **13** 3 57.9 | + 9 25.2 | -0.3045 | .5805 | .1309 | +28 | -42 |
| φ Tauri | 5½ | 2.05 | 11.5 | 27 3.3 | 7 39.7 | -11 1.9 | -0.7484 | .5838 | .1205 | + 2 | -63 |
| $\chi^1$ Tauri | 5½ | 2.03 | 12.1 | 25 20.3 | 8 33.5 | -10 10.3 | +1.0998 | .5846 | .1179 | +90 | +37 |
| $\chi^2$ Tauri | 8½ | 2.03 | 12.1 | 25 20.3 | 8 33.7 | -10 10.1 | +1.1046 | .5846 | .1179 | +90 | +38 |
| B. A. C. 1444 | 6 | +1.99 | +10.4 | +28 22.6 | 15 40.6 | - 3 20.5 | -1.2089 | .5907 | +.0970 | -37 | -62 |
| B. A. C. 1648 | 6½ | 1.86 | 9.8 | 27 49.9 | **14** 6 29 3 | +10 51.0 | +0.4294 | .6007 | .0493 | +73 | + 3 |
| B. A. C. 1649 | 6½ | 1.88 | 9.2 | 29 26.6 | 6 31.9 | +10 53.4 | -1.1860 | .6007 | .0490 | -35 | -61 |
| β Tauri | 2 | 1.84 | 9.0 | 28 30.2 | 8 25.0 | -11 18.3 | -0.1552 | .6018 | .0426 | +36 | -26 |
| B. A. C. 1709 | 6½ | 1.84 | 8.8 | 29 5.3 | 9 38.5 | -10 7.9 | -0.6918 | .6024 | .0386 | + 5 | -59 |
| B. A. C. 1746 | 6½ | +1.80 | + 9.1 | +27 34.9 | 11 57.5 | - 7 54.9 | +0.8972 | .6037 | +.0307 | +90 | +31 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### AUGUST.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| B. A. C. 1772 | 6 | +1.81 | + 8.5 | +29 8.7 | **14** 13 9.2 | - 6 46.3 | -0.6327 | .6043 | +.0266 | + 8 | -54 |
| 136 Tauri | 5 | 1.74 | 8.5 | 27 35.0 | 18 16.6 | - 1 52.2 | +1.0202 | .6058 | .0089 | +90 | +41 |
| B. A. C. 1882 | 6½ | 1.75 | 8.0 | 28 55.4 | 19 25.0 | - 0 46.7 | -0.3107 | .6062 | +.0047 | +27 | -32 |
| κ Aurigæ | 4½ | 1.70 | 7.3 | 29 32.6 | **15** 2 11.9 | + 5 42.5 | -0.9766 | .6075 | -.0189 | -15 | -61 |
| B. A. C. 2097 | 6½ | 1.64 | 6.8 | 28 17.6 | 7 37.3 | +10 53.7 | +0.1147 | .6079 | .0383 | +52 | -12 |
| 49 Aurigæ | 5½ | 1.63 | 6.7 | 28 7.1 | 9 22.0 | -11 26.1 | +0.2158 | .6079 | .0443 | +58 | - 7 |
| 53 Aurigæ | 6 | +1.63 | + 6.5 | +29 5.4 | 10 29.5 | -10 21.5 | -0.8017 | .6078 | -.0482 | - 2 | -61 |
| 54 Aurigæ | 6 | 1.61 | 6.5 | 28 22.3 | 10 55.8 | - 9 56.5 | -0.1096 | .6078 | .0499 | +38 | -24 |
| 28 Geminor. | 6 | 1.62 | 6.3 | 29 5.8 | 12 47.5 | - 8 9.5 | -0 9273 | .6076 | .0562 | -11 | -61 |
| 47 Geminor. | 6 | 1.52 | 5.9 | 27 3.6 | 22 28.9 | + 1 6.6 | +0.3860 | .6057 | .0896 | +70 | - 2 |
| 53 Geminor. | 6 | 1.52 | 5.3 | 28 6.7 | **16** 0 7.5 | + 2 41.0 | -0.8083 | .6049 | .0953 | - 2 | -62 |
| 59 Geminor. | 6½ | 1.50 | 5.1 | 27 52.6 | 3 16.5 | + 5 41.8 | -0.8912 | .6036 | .1056 | - 7 | -62 |
| ι Geminorum | 4 | +1.49 | + 5.1 | +28 2.6 | 3 42.4 | + 6 6.7 | -1.1023 | .6034 | -.1069 | -24 | -62 |
| υ Geminorum | 4½ | 1.45 | 4.6 | 27 10.2 | 7 28.3 | + 9 43.0 | -0.6628 | .6016 | .1192 | + 7 | -61 |
| c Geminorum | 6 | 1.43 | 4.5 | 26 4.7 | 10 31.5 | -11 21.6 | +0.0390 | .6002 | .1291 | +47 | -23 |
| ω¹ Cancri | 6 | 1.39 | 4.0 | 25 43.9 | 16 48.8 | - 5 20.1 | -0.4895 | .5962 | .1481 | +18 | -53 |
| ω² Cancri | 6½ | 1.38 | 4.1 | 25 25.8 | 17 7.3 | - 5 2.4 | -0.2365 | .5959 | .1492 | +32 | -39 |
| ψ² Cancri | 6 | 1.37 | 3.6 | 25 52.9 | 20 24.7 | - 1 53.3 | -1.1901 | .5938 | .1585 | -32 | -64 |
| λ Cancri | 6 | +1.33 | + 3.4 | +24 24.6 | **17** 0 16.9 | + 1 49.4 | -0.3702 | .5918 | -.1697 | +24 | -48 |
| β Virginis | 3½ | 1.10 | - 6.2 | 2 27.7 | **20** 19 53.7 | - 5 49.8 | -1.3778 | .5241 | .2859 | -40 | -88 |
| B. A. C. 4043 | 6½ | 1.11 | 6.7 | + 1 13.1 | **21** 0 1.2 | - 1 50.1 | -1.2927 | .5224 | .2854 | -31 | -89 |
| B. A. C. 4200 | 6 | 1.14 | 8.9 | - 3 55.9 | 14 10.2 | +11 52.5 | -0.0314 | .5187 | .2804 | +42 | -47 |
| B. A. C. 4225 | 6½ | 1.16 | 9.1 | 4 22.2 | 16 2.3 | -10 18.9 | -0.1019 | .5184 | .2794 | +39 | -50 |
| *f* Virginis | 6 | 1.17 | 9.5 | 5 9.1 | 18 35.1 | - 7 50.8 | -0.0074 | .5180 | .2779 | +44 | -45 |
| 28 Virginis | 6 | +1.18 | -10.0 | - 6 49.3 | 21 8.4 | - 5 22.3 | +1.0100 | .5177 | -.2763 | +83 | + 9 |
| B. A. C. 4294 | 6½ | 1.21 | 10.0 | 5 37.5 | **22** 23 55.1 | - 2 40.8 | -0.9929 | .5172 | .2744 | - 9 | -90 |
| *g* Virginis | 6 | 1.26 | 11.9 | 10 4.8 | 9 59.8 | + 7 5.4 | +0.9089 | .5168 | .2651 | +80 | + 3 |
| B. A. C. 4394 | 6 | 1.27 | 11.4 | 8 19.3 | 10 19.9 | + 7 24.8 | -1.0123 | .5168 | .2657 | -11 | -90 |
| 50 Virginis | 6 | 1.27 | 11.8 | 9 40.2 | 10 55.4 | + 7 59.2 | +0.2363 | .5168 | .2651 | +55 | -33 |
| 58 Virginis | 6 | 1.30 | 12.1 | 9 53.7 | 14 44.9 | +11 41.7 | -0.5373 | .5170 | .2615 | +15 | -78 |
| α Virginis | 1 | +1.34 | -12.4 | -10 31.0 | 18 34.7 | - 8 35.6 | -0.8825 | .5172 | -.2576 | - 5 | -90 |
| *i* Virginis | 6 | 1.34 | 12.9 | 12 3.9 | 19 19.6 | - 7 52.0 | +0.5480 | .5172 | .2568 | +72 | -16 |
| B. A. C. 4531 | 6 | 1.37 | 13.2 | 12 34.9 | 23 15.2 | - 4 3.7 | +0.0902 | .5176 | .2524 | +46 | -40 |
| B. A. C. 4700 | 6 | 1.57 | 14.9 | 15 43.2 | **23** 16 59.0 | -10 53.0 | -0.8366 | .5207 | .2290 | - 8 | -90 |
| B. A. C. 4722 | 6 | 1.58 | 15.4 | 17 37.5 | 19 11.0 | - 8 45.1 | +0.6542 | .5213 | .2256 | +72 | -10 |
| B. A. C. 4739 | 6½ | 1.61 | 15.7 | 18 8.7 | 20 44.6 | - 7 14.5 | +0.8570 | .5217 | .2232 | +72 | + 2 |
| B. A. C. 4923 | 6 | +1.87 | -16.8 | -20 51.5 | **24** 15 17.1 | +10 42.6 | -0.0909 | .5271 | -.1923 | +29 | -50 |
| B. A. C. 5023 | 6 | 2.02 | 17.0 | 21 56.7 | **25** 0 16.7 | - 4 35.2 | -0.5719 | .5301 | .1749 | + 3 | -83 |
| 42 Libræ | 5½ | 2.23 | 17.0 | 23 25.1 | 11 23.6 | + 6 9.7 | -0.7974 | .5339 | .1522 | -12 | -90 |
| B. A. C. 5197 | 6 | 2.25 | 17.1 | 24 19.7 | 13 56.6 | + 8 37.6 | -0.1880 | .5348 | .1467 | +19 | -56 |
| *b* Scorpii | 5 | 2.31 | 17.4 | 25 22.6 | 16 17.2 | +10 53.6 | +0.6151 | .5356 | .1416 | +61 | -10 |
| A² Scorpii | 5 | 2.33 | 17.2 | 24 57.6 | 17 30.4 | -11 55.7 | -0.0100 | .5360 | .1390 | +27 | -45 |
| B. A. C. 5253 | 6 | +2.32 | -16.9 | -24 10.0 | 17 39.4 | -11 46.9 | -0.8968 | .5360 | - 1386 | -20 | -90 |
| B. A. C. 5255 | 6 | 2.33 | 17.3 | 25 2.7 | 17 46.7 | -11 39.9 | +0.0448 | .5360 | .1383 | +30 | -42 |
| 3 Scorpii | 6 | 2.33 | 17.2 | 24 52.9 | 17 59.4 | -11 27.7 | -0.1634 | .5361 | .1379 | +19 | -54 |
| 4 Scorpii | 6 | 2.35 | 17.4 | 25 54.3 | 18 21.3 | -11 6.4 | +0.9028 | .5362 | .1370 | +64 | + 7 |
| B. A. C. 5286 | 6½ | 2.36 | 16.9 | 24 29.1 | 19 48.0 | - 9 42.7 | -0.8416 | .5367 | .1339 | -17 | -90 |
| π Scorpii | 3 | 2.38 | 17.2 | 25 45.6 | 19 53.5 | - 9 37.4 | +0.5370 | .5367 | .1336 | +56 | -15 |
| B. A. C. 5314 | 6 | +2.40 | -17.1 | -25 31.4 | 21 57.4 | - 7 37.7 | +0.0073 | .5374 | -.1290 | +27 | -45 |
| B. A. C. 5347 | 5 | 2.45 | 17.0 | 25 59.9 | **26** 0 7.1 | - 5 32.3 | +0.2526 | .5380 | .1246 | +39 | -31 |
| σ Scorpii | 3½ | 2.55 | 16.4 | 25 17.9 | 6 4.8 | + 0 13.2 | -1.2134 | .5398 | .1103 | -47 | -90 |
| α Scorpii | 1½ | 2.62 | 16.3 | 26 9.6 | 9 46.7 | + 3 47.5 | -0.6622 | .5408 | .1017 | -10 | -90 |
| τ Scorpii | 3½ | 2.70 | 16.8 | 27 57.7 | 12 35.1 | + 6 30.1 | +1.0328 | .5416 | .0949 | +62 | +18 |
| B. A. C. 5603 | 6½ | +2.78 | -16.5 | -28 16.8 | 16 44.7 | +10 31.3 | +1.0177 | .5426 | -.0848 | +62 | +17 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### AUGUST.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| 43 Ophiuchi | 6 | +3.07 | −14.1 | −28 1.4 | **27** 9 52.6 | + 3 3.8 | −0.3516 | .5455 | −.0420 | 0 | −67 |
| 3 Sagittarii | 5 | 3.24 | 12.5 | 27 47.1 | 20 38.2 | −10 33.1 | −0.9202 | .5461 | .0143 | −33 | −90 |
| B. A. C. 6063 | 6½ | 3.31 | 11 8 | 28 2.9 | **28** 0 41.7 | − 6 38.0 | −0.6671 | .5463 | .0040 | −19 | −90 |
| B. A. C. 6072 | 6½ | 3.36 | 11.9 | 28 44.5 | 1 32.3 | − 5 49.2 | +0.0990 | .5461 | −.0017 | +19 | −39 |
| γ¹ Sagittarii | 4 | 3.42 | 12.0 | 29 35.2 | 4 21.0 | − 3 6.4 | +1.0390 | .5459 | +.0054 | +61 | +20 |
| B. A. C. 6120 | 6½ | 3.40 | 11.2 | 28 22.4 | 5 10.0 | − 2 19.1 | −0.2995 | .5459 | .0074 | 0 | −63 |
| B. A. C. 6127 | 5 | +3.40 | −11.1 | −28 28.3 | 5 44.5 | − 1 45 8 | −0.1848 | .5458 | +.0090 | + 6 | −56 |
| B. A. C. 6190 | 6½ | 3.48 | 10.3 | 28 41.6 | 9 52.9 | + 2 14.0 | +0.1193 | .5456 | .0195 | +22 | −38 |
| B. A. C. 6191 | 6½ | 3.47 | 10.2 | 28 19.6 | 9 53.3 | + 2 14.4 | −0.2858 | .5456 | .0195 | + 1 | −63 |
| B. A. C. 6220 | 6½ | 3.55 | 9.8 | 28 29.4 | 11 56.7 | + 4 13.5 | −0.0603 | .5454 | .0249 | +13 | −48 |
| φ Sagittarii | 3½ | 3.61 | 7.3 | 27 7.1 | 22 34.6 | − 9 30.7 | −1.1725 | .5436 | .0517 | −49 | −90 |
| τ Sagittarii‡ | 3½ | 3.77 | 5.5 | 27 51.1 | **29** 8 11.1 | − 0 13.9 | +0.2509 | .5412 | .0753 | +34 | −30 |
| B. A. C. 6628 | 6 | +3.86 | − 4.0 | −28 6.2 | 16 11.7 | + 7 30.5 | +1.2123 | .5388 | +.0945 | +62 | +37 |
| B. A. C. 6666 | 6 | 3.84 | 3.0 | 27 14.3 | 18 40.8 | + 9 54.5 | +0.4957 | .5380 | .1003 | +51 | −17 |
| ω Sagittarii | 5 | 3.93 | − 0.4 | 26 37.6 | **30** 6 45.1 | − 2 25.2 | +1.1937 | .5334 | .1275 | +64 | +33 |
| A Sagittarii | 5 | 3.95 | + 0.1 | 26 31.8 | 8 13.7 | − 0 59.5 | +1.2767 | .5328 | .1307 | +64 | +45 |
| B. A. C. 7049 | 6 | 3.93 | 4.1 | 22 48.0 | 22 52.2 | −10 49.4 | −0.7071 | .5267 | .1608 | − 6 | −90 |
| 17 Capricorni | 6 | 3.94 | 5.9 | 21 57.7 | **31** 6 58.1 | − 2 58.9 | −0.2666 | .5231 | .1760 | +18 | −60 |
| B. A. C. 7197 | 6 | +3.98 | + 6.0 | −23 11.2 | 8 1.1 | − 1 57 9 | +1.2677 | .5226 | +.1780 | +67 | +38 |
| η Capricorni | 5½ | 3.93 | 8.1 | 20 20.5 | 15 59.8 | + 5 45.9 | −0.3881 | .5190 | .1918 | +14 | −68 |
| 27 Capricorni | 6 | 3.96 | 8.5 | 21 3.0 | 18 32.3 | + 8 13.7 | +0.8835 | .5179 | .1960 | +69 | + 4 |
| 30 Capricorni | 6 | +3.90 | + 9.8 | −18 30.0 | 22 48.1 | −11 38.3 | −1.0676 | .5161 | +.2028 | −23 | −90 |

### SEPTEMBER.

| Name. | Mag. | Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| γ Capricorni | 3½ | +3.89 | +12.1 | −17 13.1 | **1** 10 2.6 | − 0 44.2 | −0.0957 | .5116 | +.2195 | +32 | −50 |
| δ Capricorni | 3 | 3.88 | 12.8 | 16 41.1 | 13 36.9 | + 2 43.7 | +0.1136 | .5102 | .2242 | +44 | −39 |
| ι Aquarii | 4 | 3.84 | 14.9 | 14 28.0 | 23 43.2 | −11 27.9 | +0.0203 | .5067 | .2367 | +41 | −44 |
| 42 Aquarii | 6 | 3.81 | 15.9 | 13 26.7 | **2** 5 9.8 | − 6 10.8 | +0.2121 | .5051 | .2426 | +52 | −34 |
| 45 Aquarii | 6 | 3.83 | 16.0 | 13 55.2 | 6 19.1 | − 5 3.5 | +1.0097 | .5047 | .2438 | +76 | +10 |
| σ Aquarii | 4½ | 3.77 | 17.0 | 11 18.4 | 12 29.6 | + 0 56.3 | −0.3066 | .5030 | .2497 | +26 | −62 |
| 58 Aquarii | 6 | +3.77 | +17.1 | −11 32.1 | 13 2.3 | + 1 28.0 | +0.0772 | .5029 | +.2503 | +46 | −41 |
| Saturn | | | | 11 42.8 | 14 4.0 | + 2 27.9 | +0.5284 | .5059 | .2528 | +71 | −18 |
| 64 Aquarii | 6½ | 3.75 | 17.8 | 10 40.0 | 17 4.7 | + 5 23.4 | +0.1542 | .5021 | .2538 | +50 | −37 |
| λ Aquarii | 4 | 3.70 | 18.8 | 8 14.0 | **3** 0 12.3 | −11 41.2 | −0.6500 | .5009 | .2594 | +10 | −87 |
| 78 Aquarii | 6 | 3.69 | 18.9 | 7 51.4 | 1 15.4 | −10 40.0 | −0.7838 | .5008 | .2602 | + 3 | −90 |
| 81 Aquarii | 6 | 3.67 | 19 5 | 7 43.3 | 4 54.5 | − 7 7.1 | +0.0246 | .5003 | .2626 | +45 | −43 |
| 82 Aquarii | 6 | +3.67 | +19.5 | − 7 14.0 | 5 31.5 | − 6 31.1 | −0.3396 | .5002 | +.2630 | +26 | −64 |
| h¹ Aquarii | 5½ | 3.69 | 19.7 | 8 21.4 | 6 54.7 | − 5 10.3 | +1.2377 | .5001 | .2638 | +82 | +26 |
| h² Aquarii | 7 | 3.69 | 19.7 | 8 25.0 | 7 0.1 | − 5 5.0 | +1.3250 | .5001 | .2639 | +82 | +35 |
| φ Aquarii | 4½ | 3.66 | 20.3 | 6 42.7 | 11 50.4 | − 0 23.0 | +0.7697 | .4996 | .2666 | +78 | − 5 |
| 96 Aquarii | 5½ | 3.63 | 20.8 | 5 47.7 | 14 33.4 | + 2 15.4 | +0.5091 | .4995 | .2680 | +74 | −19 |
| B. A. C. 8134 | 6½ | 3.63 | 20.8 | 5 20.7 | 15 37.7 | + 3 17.9 | +0.3112 | .4995 | .2685 | +61 | −29 |
| B. A. C. 8184 | 5½ | +3.62 | +21.4 | − 5 12.2 | 20 0.0 | + 7 32.8 | +1.3344 | .4995 | +.2702 | +85 | +35 |
| B. A. C. 8311 | 6½ | 3.52 | 22.3 | − 0 34.5 | **4** 9 32.4 | − 3 17.9 | +0.0602 | .4999 | .2737 | +48 | −42 |
| 60 Piscium | 6 | 3.39 | 23.4 | + 6 4.2 | **5** 13 12.5 | − 0 25.8 | +0.5459 | .5082 | .2701 | +78 | −17 |
| 62 Piscium | 6 | 3.39 | 23.2 | 6 37.8 | 13 39.7 | + 0 0.6 | +0.0764 | .5083 | .2697 | +49 | −40 |
| δ Piscium | 4½ | 3.39 | 23.1 | 6 55.0 | 13 51.9 | + 0 12.4 | −0.1721 | .5084 | .2696 | +36 | −53 |
| π Piscium | 6 | 3.27 | 22.9 | 11 30.8 | **6** 14 11.0 | − 0 12.7 | +1.3618 | .5214 | .2530 | +90 | +45 |
| 104 Piscium | 6½ | +3.27 | +22.5 | +13 39.8 | 15 12.5 | + 0 46.8 | −0.6337 | .5222 | +.2520 | +12 | −75 |
| 26 Arietis | 6 | 3.18 | 20.5 | 19 18.6 | **7** 5 20.1 | + 0 7.4 | −0.7841 | .5401 | .2211 | + 2 | −64 |
| B. A. C. 782 | 6½ | 3.17 | 20.6 | 18 20.3 | 16 41.8 | + 1 26.3 | +0.5235 | .5412 | .2189 | +79 | −10 |
| μ Arietis | 5½ | 3.16 | 20.1 | 19 29.2 | 20 37.3 | + 5 13.8 | +0.1771 | .5445 | .2123 | +55 | −26 |
| 47 Arietis | 6 | 3.13 | 19.5 | 20 10.5 | **8** 3 32.8 | +11 54.8 | +0.8904 | .5504 | .1998 | +90 | +13 |
| e Arietis, *mult.* | 4½ | +3.14 | +19.2 | +20 50.9 | 4 2.5 | −11 36.6 | +0.2930 | .5509 | +.1988 | +62 | −19 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### SEPTEMBER.

| STAR'S— | | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| 64 Arietis | 6 | +3.10 | +17.5 | +24 17.3 | **8** 14 44.6 | − 1 17.5 | −1.2451 | .5603 | +.1766 | −36 | −66 |
| 66 Arietis | 6½ | 3.07 | 17.9 | 22 22.8 | 16 31.1 | + 0 25.1 | +1.0309 | .5619 | .1726 | +90 | +26 |
| 7 Tauri, *mult.* | 6 | 3.07 | 17.1 | 24 3.1 | 18 59.6 | + 2 47.9 | −0.2695 | .5639 | .1671 | +30 | 43 |
| 9 Tauri | 6 | 3.06 | 17.4 | 22 48.2 | 20 4.0 | + 3 50.0 | +1.1918 | .5648 | .1645 | +90 | +40 |
| 11 Tauri | 6 | 3.06 | 16.6 | 24 55.9 | 21 35.9 | + 5 18.4 | −0.7471 | .5661 | .1610 | + 3 | −64 |
| *g* Pleiadum | 5½ | 3.04 | 16.7 | 23 54.1 | 23 16.8 | + 6 55.5 | +0.5776 | .5676 | .1568 | +85 | + 1 |
| *b* Pleiadum | 4 | +3.04 | +16.8 | +23 43.6 | 23 18.7 | + 6 57.4 | +0.7635 | .5676 | +.1567 | +90 | +11 |
| *m* Pleiadum | 7 | 3.06 | 16.6 | 24 27.1 | 23 24.9 | + 7 3.4 | +0.0340 | .5677 | .1563 | +47 | −27 |
| *e* Pleiadum | 5 | 3.05 | 16.7 | 24 4.9 | 23 26.5 | + 7 4.9 | +0.4191 | .5677 | .1563 | +71 | − 7 |
| *c* Pleiadum | 5 | 3.04 | 16.7 | 23 59.0 | 23 41.8 | + 7 19.6 | +0.5595 | .5679 | .1558 | +83 | 0 |
| *d* Pleiadum | 5 | 3.03 | 16.7 | 23 33.9 | 23 54.6 | + 7 31.9 | +1.0081 | .5681 | .1554 | +90 | +27 |
| η Tauri | 3 | 3.04 | 16.6 | 23 43.5 | **9** 0 22.9 | + 7 59.1 | +0.9311 | .5685 | .1541 | +90 | +21 |
| *f* Pleiadum | 4 | +3.04 | +16.5 | +23 40.6 | 1 4.1 | + 8 38.8 | +1.0849 | .5692 | +.1524 | +90 | +32 |
| *h* Pleiadum | 5½ | 3.03 | 16.5 | 23 45.6 | 1 4.7 | + 8 39.3 | +1.0005 | .5692 | .1524 | +90 | +26 |
| B. A. C. 1192 | 6 | 3.05 | 16.0 | 25 12.4 | 1 30.6 | + 9 4.3 | −0.4193 | .5695 | .1514 | +22 | −50 |
| *p* Tauri | 6 | 3.00 | 15.0 | 26 9.6 | 9 46.0 | − 6 59.4 | −0.2353 | .5762 | .1298 | +32 | −38 |
| φ Tauri, *mult.* | 5½ | 2.98 | 14.2 | 27 3.4 | 13 31.3 | − 3 22.9 | −0.6842 | .5792 | .1192 | + 6 | −62 |
| $\chi^1$ Tauri | 5½ | 2.94 | 14.6 | 25 20.3 | 14 26.1 | − 2 30.3 | +1.1803 | .5798 | .1167 | +90 | +44 |
| $\chi^2$ Tauri | 8½ | +2.94 | +14.6 | +25 20.6 | 14 26.4 | − 2 30.0 | +1.1849 | .5798 | +.1167 | +90 | +45 |
| B. A. C. 1444 | 6 | 2.93 | 12.6 | 28 22.6 | 21 40.1 | + 4 26.4 | −1.1524 | .5848 | .0958 | −30 | −62 |
| B. A. C. 1648 | 6½ | 2.79 | 10.7 | 27 49.9 | **10** 12 49.4 | − 5 1.5 | +0.4991 | .5930 | .0485 | +79 | + 7 |
| B. A. C. 1649 | 6½ | 2.82 | 10.1 | 29 26.6 | 12 52.1 | − 4 58.9 | −1.1355 | .5930 | .0483 | −29 | −61 |
| β Tauri | 2 | 2.78 | 10.1 | 28 30.2 | 14 47.9 | − 3 7.9 | −0.0933 | .5939 | .0422 | +39 | −22 |
| B. A. C. 1709 | 6½ | 2.78 | 9.7 | 29 5.3 | 16 3.3 | − 1 55.6 | −0.6368 | .5944 | .0378 | + 8 | −55 |
| B. A. C. 1746 | 6½ | +2.72 | +10.0 | +27 35.0 | 18 25.9 | + 0 20.9 | +0.9712 | .5953 | +.0299 | +90 | +36 |
| B. A. C. 1772 | 6 | 2.74 | 9.2 | 29 8.7 | 19 39.4 | + 1 31.4 | −0.5785 | .5957 | .0260 | +12 | −50 |
| 136 Tauri | 5 | 2.66 | 9.0 | 27 35.0 | **11** 0 55.1 | + 6 33.9 | +1.0937 | .5970 | .0084 | +90 | +46 |
| B. A. C. 1882 | 6½ | 2.68 | 8.3 | 28 55.4 | 2 5.4 | + 7 41.3 | −0.2551 | .5973 | +.0046 | +30 | −29 |
| κ Aurigæ | 4½ | 2.61 | 6.9 | 29 32.6 | 9 3.8 | − 9 38.0 | −0.9328 | .5982 | −.0191 | −12 | −61 |
| B. A. C. 2097 | 6½ | 2.52 | 6.4 | 28 17.6 | 14 39.0 | − 4 16.9 | +0.1716 | .5981 | .0378 | +55 | − 9 |
| 49 Aurigæ | 5½ | +2.49 | + 6.2 | +28 7.1 | 16 26.8 | − 2 33.6 | +0.2735 | .5980 | −.0440 | +62 | − 4 |
| 53 Aurigæ | 6 | 2.50 | 5.7 | 29 5.4 | 17 36.4 | − 1 27.1 | −0.7593 | .5979 | .0477 | + 1 | −61 |
| 54 Aurigæ | 6 | 2.49 | 5.8 | 28 22.3 | 18 3.5 | − 1 1.1 | −0.0571 | .5978 | .0493 | +42 | −21 |
| 28 Geminor. | 6 | 2.48 | 5.4 | 29 5.7 | 19 58.6 | + 0 49.2 | −0.8878 | .5975 | .0557 | − 8 | −61 |
| 47 Geminor. | 6 | 2.33 | 4.5 | 27 3.6 | **12** 5 58.4 | +10 23.8 | +0.4411 | .5950 | .0885 | +74 | + 1 |
| 53 Geminor. | 6 | 2.31 | 3.7 | 28 6.7 | 7 40.1 | −11 58.7 | −0.7720 | .5944 | .0940 | 0 | −62 |
| 59 Geminor. | 6½ | +2.27 | + 3.4 | +27 52.6 | 10 55.1 | − 8 51.9 | −0.8570 | .5931 | −.1044 | − 5 | −62 |
| ι Geminor. | 4 | 2.27 | 3.2 | 28 2.6 | 11 21.9 | − 8 26.2 | −1.0718 | .5930 | .1057 | −22 | −62 |
| υ Geminor. | 4½ | 2.21 | 2.8 | 27 10.2 | 15 15.0 | − 4 42.7 | −0.6276 | .5912 | .1178 | +10 | −59 |
| *c* Geminor. | 6 | 2.16 | 2.8 | 26 4.7 | 18 24.1 | − 1 41.3 | +0.0834 | .5897 | .1271 | +50 | −21 |
| $\omega^1$ Cancri., *mult.* | 6 | 2.09 | 1.9 | 25 43.9 | **13** 0 53.5 | + 4 32.3 | −0.4557 | .5860 | .1462 | +19 | −51 |
| $\omega^2$ Cancri | 6½ | 2.07 | 1.9 | 25 25.7 | 1 12.6 | + 4 50.6 | −0.1996 | .5858 | .1470 | +34 | −38 |
| $\psi^2$ Cancri | 6 | +2.06 | + 1.3 | +25 52.9 | 4 36.4 | + 8 6.3 | −1.1695 | .5837 | −.1564 | −29 | −64 |
| λ Cancri | 6 | 1.98 | 1.1 | 24 24.7 | 8 35.8 | +11 56.1 | −0.3404 | .5811 | .1672 | +26 | −47 |
| $\upsilon^1$ Cancri., *mult.* | 7 | 1.96 | 0.6 | 24 56.3 | 11 1.0 | − 9 44.3 | −1.2814 | .5795 | .1738 | −43 | −65 |
| $\upsilon^2$ Cancri | 6½ | 1.95 | 0.6 | 24 33.3 | 11 47.9 | − 8 59.3 | −1.0332 | .5789 | .1756 | −16 | −66 |
| $\upsilon^3$ Cancri | 6 | 1.94 | 0.5 | 24 29.9 | 12 57.4 | − 7 52.5 | −1.1811 | .5779 | .1787 | −29 | −66 |
| 32 Cancri | 6 | 1.93 | 0.5 | 24 30.3 | 13 33.2 | − 7 18.1 | −1.2957 | .5775 | .1802 | −45 | −66 |
| γ Cancri | 4½ | +1.84 | + 0.5 | +21 54.8 | 17 44.3 | − 3 16.7 | +0.5271 | .5746 | −.1905 | +79 | − 5 |
| 83 Cancri | 6 | 1.65 | − 0.8 | 18 13.8 | **14** 8 31.0 | +10 56.3 | +1.1601 | .5634 | .2227 | +90 | +30 |
| 8 Leonis | 6 | 1.57 | 1.5 | 16 59.6 | 16 12.5 | − 5 39.0 | +0.6337 | .5577 | .2368 | +87 | − 5 |
| 34 Leonis | 6 | 1.43 | 2.8 | 13 57.9 | **15** 7 24.8 | + 9 1.1 | −0.1086 | .5470 | .2590 | +39 | −46 |
| 37 Leonis | 6 | 1.43 | 3.2 | +14 20.7 | 9 40.4 | +11 12.0 | −1.0740 | .5454 | .2618 | −15 | −76 |
| 58 Virginis | 6 | +1.17 | −11.1 | − 9 53.8 | **19** 0 27.0 | − 0 48.2 | −0.5526 | .5214 | −.2640 | −14 | −79 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### SEPTEMBER.

| STAR'S— | | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d | h m | h m | | | | ° | ° |
| α Virginis | 6 | +1.18 | -11.3 | -10 31.0 | **19** | 4 13.7 | + 2 51.4 | -0.8972 | .5218 | -.2601 | - 5 | -90 |
| i Virginis | 6 | 1.17 | 11.6 | 12 3.9 | | 4 58.0 | + 3 34.4 | +0.5263 | .5219 | .2593 | +71 | -17 |
| MERCURY | | | | 11 51.3 | | 6 15.5 | + 4 49.5 | -0.0276 | .4910 | .2402 | +40 | -46 |
| B. A. C. 4531 | 6 | 1.19 | 11.9 | 12 34.9 | | 8 50.2 | + 7 19.3 | +0.0703 | .5225 | .2549 | +44 | -41 |
| B. A. C. 4700 | 6 | 1.32 | 13.2 | 15 43.2 | **20** | 2 16.9 | + 0 12.9 | -0.8869 | .5265 | .2315 | - 8 | -90 |
| B. A. C. 4722 | 6 | 1.33 | 13.7 | 17 37.5 | | 4 26.6 | + 2 18.5 | +0.6292 | .5270 | .2282 | +71 | -11 |
| B. A. C. 4739 | 6½ | +1.34 | -13.9 | -18 8.6 | | 5 58.6 | + 3 47.5 | +0.8308 | .5275 | -.2258 | +72 | - 0 |
| B. A. C. 4923 | 6 | 1.54 | 15.0 | 20 51.5 | **21** | 0 11.0 | - 2 35.6 | -0.1095 | .5329 | .1940 | +28 | -51 |
| B. A. C. 5023 | 6 | 1.64 | 15.4 | 21 56.7 | | 9 0.8 | + 5 56.7 | -0.5869 | .5358 | .1768 | + 2 | -85 |
| 42 Libræ | 5½ | 1.81 | 15.6 | 23 25.1 | | 19 56.1 | - 7 29.9 | -0.8096 | .5392 | .1535 | -14 | -90 |
| B. A. C. 5197 | 6 | 1.85 | 15.7 | 24 19.7 | | 22 26.6 | - 5 4.5 | -0.2045 | .5400 | .1480 | +18 | -57 |
| *b* Scorpii | 5 | 1.89 | 16.1 | 25 22.6 | **22** | 0 44.8 | - 2 51.0 | +0.5942 | .5407 | .1428 | +60 | -12 |
| A² Scorp., *mult.* | 5 | +1.90 | -15.9 | -24 57.6 | | 1 56.8 | - 1 41.4 | -0.0273 | .5411 | -.1402 | +26 | -46 |
| B. A. C. 5253 | 6 | 1.89 | 15.6 | 24 9.9 | | 2 5.7 | - 1 32.8 | -0.9074 | .5412 | .1399 | -20 | -90 |
| B. A. C. 5255 | 6 | 1.91 | 16.0 | 25 2.7 | | 2 12.9 | - 1 25.9 | +0.0277 | .5412 | .1396 | +29 | -43 |
| 3 Scorpii | 6 | 1.91 | 15.9 | 24 52.8 | | 2 25.3 | - 1 13.9 | -0.1793 | .5412 | .1390 | +18 | -55 |
| 4 Scorpii | 6 | 1.93 | 16.1 | 25 54.3 | | 2 46.9 | - 0 53.0 | +0.8802 | .5413 | .1383 | +64 | + 6 |
| B. A. C. 5286 | 6½ | 1.93 | 15.6 | 24 29.1 | | 4 12.2 | + 0 29.3 | -0.8525 | .5417 | .1350 | -18 | -90 |
| π Scorpii | 3 | +1.94 | -16.0 | -25 45.6 | | 4 17.7 | + 0 34.7 | +0.5170 | .5417 | -.1348 | +55 | -16 |
| B. A. C. 5314 | 6 | 1.97 | 15.8 | 25 31.4 | | 6 19.6 | + 2 32.4 | -0.0090 | .5423 | .1300 | +26 | -45 |
| B. A. C. 5347 | 5 | 2.01 | 15.9 | 25 59.9 | | 8 27.3 | + 4 35.7 | +0.2349 | .5428 | .1251 | +38 | -32 |
| σ Scorpii | 3½ | 2.09 | 15.4 | 25 17.9 | | 14 19.7 | +10 16.0 | -1.2207 | .5443 | .1110 | -48 | -90 |
| α Scorpii | 1½ | 2.17 | 15.5 | 26 9.5 | | 17 58.4 | -10 12.8 | -0.6725 | .5450 | .1022 | -11 | -90 |
| τ Scorpii | 3½ | 2.23 | 15.9 | 27 57.7 | | 20 48.5 | - 7 28.7 | +1.0125 | .5456 | .0954 | +62 | +17 |
| B. A. C. 5603 | 6½ | +2.32 | -15.7 | -28 16.8 | **23** | 0 50.9 | - 3 34.7 | +0.9984 | .5464 | -.0851 | +62 | +16 |
| 43 Ophiuchi | 6 | 2.60 | 13.9 | 28 1.4 | | 17 47.8 | -11 13.3 | -0.3603 | .5478 | .0421 | 0 | -68 |
| 3 Sagittarii | 5 | 2.77 | 12.5 | 27 47.1 | **24** | 4 28.3 | - 0 55.3 | -0.9260 | .5476 | .0142 | -34 | -90 |
| B. A. C. 6063 | 6½ | 2.85 | 11.9 | 28 2.9 | | 8 30.4 | + 2 58.3 | -0.6727 | .5473 | .0038 | -20 | -90 |
| B. A. C. 6072 | 6½ | 2.88 | 12.0 | 28 44.5 | | 9 20.6 | + 3 46.8 | +0.0906 | .5472 | -.0015 | +19 | -39 |
| γ¹ Sagittarii | 4 | 2.95 | 12.0 | 29 35.2 | | 12 8.4 | + 6 28.6 | +1.0280 | .5470 | +.0057 | +61 | +19 |
| B. A. C. 6120 | 6½ | +2.93 | -11.3 | -28 22.4 | | 12 57.1 | + 7 15.7 | -0.3062 | .5467 | +.0078 | - 1 | -64 |
| B. A. C. 6127 | 5 | 2.94 | 11.3 | 28 28.3 | | 13 31.4 | + 7 48.8 | -0.1916 | .5466 | .0093 | + 5 | -56 |
| B. A. C. 6190 | 6½ | 3.01 | 10.7 | 28 41.6 | | 17 38.9 | +11 47.7 | +0.1119 | .5460 | .0196 | +22 | -39 |
| B. A. C. 6191 | 6½ | 3.00 | 10.6 | 28 19.6 | | 17 39.2 | +11 48.0 | -0.2917 | .5460 | .0198 | + 1 | -63 |
| B. A. C. 6220 | 6½ | 3.09 | 10.4 | 28 29.4 | | 19 42.1 | -10 13.4 | -0.0663 | .5457 | .0249 | +13 | -49 |
| φ Sagittarii | 3½ | 3.17 | 8.1 | 27 7.1 | **25** | 6 18.5 | + 0 1.0 | -1.1741 | .5432 | .0517 | -49 | -90 |
| τ Sagittarii | 3½ | +3.33 | - 6.5 | -27 51.1 | | 15 54.6 | + 9 17.3 | +0.2480 | .5403 | +.0753 | +34 | -31 |
| B. A. C. 6628 | 6 | 3.46 | 5.1 | 28 6.2 | | 23 55.6 | - 6 57.9 | +1.2089 | .5373 | .0945 | +62 | +37 |
| B. A. C. 6666 | 6 | 3.46 | 4.3 | 27 14.3 | **26** | 2 25.0 | - 4 33.6 | +0.4939 | .5363 | .1003 | +51 | -17 |
| ω Sagittarii | 5 | 3.59 | 1.8 | 26 37.6 | | 14 31.0 | + 7 8.4 | +1.1934 | .5314 | .1272 | +64 | +33 |
| A Sagittarii | 5 | 3.61 | - 1.4 | 26 31.8 | | 16 0.0 | + 8 34.5 | +1.2761 | .5308 | .1302 | +64 | +45 |
| B. A. C. 7049 | 6 | 3.65 | + 2.8 | 22 48.0 | **27** | 6 41.5 | - 1 12.5 | -0.7049 | .5244 | .1600 | - 6 | -90 |
| 17 Capricorni | 6 | +3.69 | + 4.5 | -21 57.7 | | 14 49.4 | + 6 40.1 | -0.2637 | .5207 | +.1754 | +19 | -60 |
| B. A. C. 7197 | 6 | 3.73 | 4.4 | 23 11.2 | | 15 52.5 | + 7 41.1 | +1.2700 | .5203 | .1772 | +67 | +39 |
| η Capricorni | 5½ | 3.72 | 6.9 | 20 20.5 | | 23 53.1 | - 8 33.1 | -0.3847 | .5169 | .1909 | +15 | -68 |
| 27 Capricorni | 6 | 3.76 | 7.2 | 21 3.0 | **28** | 2 26.1 | - 6 4.8 | +0.8859 | .5158 | .1936 | +69 | + 4 |
| 30 Capricorni | 6 | 3.71 | 8.7 | 18 30.0 | | 6 42.8 | - 1 56.0 | -1.0632 | .5142 | .2020 | -23 | -90 |
| γ Capricorni | 3½ | 3.76 | 11.1 | 17 13.1 | | 17 59.1 | + 9 0.0 | -0.0923 | .5099 | .2187 | +33 | -50 |
| δ Capricorni | 3 | +3.77 | +11.9 | -16 41.1 | | 21 33.8 | -11 31.7 | +0.1171 | .5087 | +.2236 | +44 | -38 |
| ι Aquarii | 4 | 3.78 | 14.1 | 14 28.0 | **29** | 6 40.7 | - 2 42.6 | +0.0233 | .5058 | .2360 | +41 | -44 |
| 42 Aquarii | 6 | 3.77 | 15.3 | 13 26.7 | | 13 7.2 | + 3 34.4 | +0.2144 | .5043 | .2421 | +52 | -34 |
| 45 Aquarii | 6 | 3.79 | 15.4 | 13 55.2 | | 14 16.3 | + 4 41.5 | +1.0097 | .5041 | .2433 | +76 | +10 |
| SATURN | | | | 12 22.2 | | 18 21.3 | + 8 39.4 | +0.3293 | .5069 | .2485 | +60 | -27 |
| σ Aquarii | 4½ | +3.76 | +16.8 | -11 18.4 | | 20 26.2 | +10 40.6 | -0.3043 | .5029 | +.2496 | +26 | -62 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

| STAR'S— | | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. $\Delta\alpha$ | Red'ns from 1876.0. $\Delta\delta$ | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | $Y$ | $x'$ | $y'$ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| **SEPTEMBER.** | | | | | | | | | | | |
| 58 Aquarii | 6 | +3.77 | +16.9 | −11 32.1 | **29** 20 58.9 | +11 12.4 | +0.0787 | .5028 | +.2500 | +46 | −41 |
| 64 Aquarii | 6½ | 3.77 | 17.7 | 10 40.0 | **30** 1 0.7 | − 8 52.8 | +0.1549 | .5022 | .2537 | +50 | −36 |
| λ Aquarii | 4 | 3.73 | 19.1 | 8 14.0 | 8 6.6 | − 1 59.1 | −0.6480 | .5015 | .2594 | +10 | −87 |
| 78 Aquarii | 6 | 3.73 | 19.2 | 7 51.4 | 9 9.3 | − 0 58.2 | −0.7814 | .5014 | .2602 | + 3 | −90 |
| 81 Aquarii | 6 | 3.74 | 19.6 | 7 43.3 | 12 47.2 | + 2 33.5 | +0.0236 | .5012 | .2627 | +44 | −44 |
| 82 Aquarii | 6 | 3.74 | 19.8 | 7 14.0 | 13 24.1 | + 3 9.2 | −0.3392 | .5010 | .2631 | +26 | −64 |
| $k^1$ Aquarii | 5½ | +3.75 | +19.8 | − 8 21.4 | 14 46.7 | + 4 29.5 | +1.2308 | .5011 | +.2640 | +82 | +26 |
| $k^2$ Aquarii | 7 | 3.76 | 19.8 | 8 25.0 | 14 52.1 | + 4 34.8 | +1.3183 | .5011 | .2641 | +82 | +34 |
| φ Aquarii | 4½ | 3.74 | 20.7 | 6 42.7 | 19 40.4 | + 9 14.7 | +0.7637 | .5012 | .2672 | +79 | − 5 |
| 96 Aquarii | 5½ | 3.74 | 21.2 | 5 47.7 | 22 22.2 | +10 52.0 | +0.5042 | .5012 | .2686 | +73 | −19 |
| B. A. C. 8134 | 6½ | +3.74 | +21.4 | − 5 20.7 | 23 26.0 | −11 6.1 | +0.3068 | .5012 | +.2691 | +61 | −29 |
| **OCTOBER.** | | | | | | | | | | | |
| B. A. C. 8184 | 5½ | +3.75 | +21.8 | − 5 12.1 | **1** 3 46.0 | − 6 53.5 | +1.3240 | .5016 | +.2711 | +85 | +34 |
| B. A. C. 8311 | 6½ | 3.71 | 23.8 | 0 34.4 | 17 9.7 | + 6 7.0 | +0.0516 | .5037 | .2751 | +47 | −42 |
| 60 Piscium | 6 | 3.72 | 25.8 | + 6 4.3 | **2** 20 25.0 | + 8 34.3 | +0.5234 | .5132 | .2721 | +76 | −17 |
| 62 Piscium | 6 | 3.71 | 25.6 | 6 37.8 | 20 51.7 | + 9 0.2 | +0.0571 | .5134 | .2720 | +48 | −41 |
| δ Piscium | 4½ | 3.71 | 25.6 | 6 55.0 | 21 3.7 | + 9 11.9 | −0.1894 | .5135 | .2719 | +35 | −54 |
| *e* Piscium | 4 | +3.72 | +25.9 | + 7 13.7 | **3** 4 14.6 | − 7 50.4 | +1.4220 | .5174 | +.2683 | +90 | +54 |
| π Piscium | 6 | 3.73 | 25.9 | 11 30.8 | 20 55.2 | + 8 19.0 | +1.3222 | .5277 | .2554 | +90 | +40 |
| 104 Piscium | 6½ | 3.73 | 25.7 | 13 39.8 | 21 55.3 | + 9 17.2 | −0.6572 | .5284 | .2546 | +11 | −76 |
| 26 Arietis | 6 | 3.77 | 23.9 | 19 18.6 | **4** 21 34.1 | + 8 8.7 | −0.8164 | .5466 | .2233 | 0 | −71 |
| B. A. C. 782 | 6½ | 3.77 | 23.9 | 18 20.4 | 22 54.1 | + 9 26.1 | +0.4804 | .5476 | .2211 | +74 | −12 |
| μ Arietis | 5½ | 3.78 | 23.4 | 19 29.3 | **5** 2 45.1 | −10 51.0 | +0.1352 | .5510 | .2144 | +52 | −28 |
| 47 Arietis | 6 | +3.78 | +22.8 | +20 10.6 | 9 32.9 | − 4 17.8 | +0.8410 | .5567 | +.2016 | +90 | +10 |
| ε Arietis, *mult.* | 4½ | 3.79 | 22.7 | 20 51.0 | 10 2.1 | − 3 49.6 | +0.2476 | .5571 | .2006 | +59 | −21 |
| 64 Arietis | 6 | 3.83 | 20.7 | 24 17.3 | 20 33.2 | + 6 18.4 | −1.2844 | .5659 | .1781 | −42 | −66 |
| 66 Arietis | 6½ | 3.79 | 20.9 | 22 22.8 | 22 18.0 | + 7 59.3 | +0.9770 | .5673 | .1741 | +90 | +22 |
| 7 Tauri, *mult.* | 6 | 3.83 | 20.2 | 24 3.1 | **6** 0 44.3 | +10 20.1 | −0.3170 | .5693 | .1681 | +27 | −46 |
| 9 Tauri | 6 | 3.80 | 20.4 | 22 48.3 | 1 47.7 | +11 21.1 | +1.1361 | .5703 | .1657 | +90 | +35 |
| 11 Tauri | 6 | +3.83 | +19.7 | +24 55.9 | 3 18.3 | −11 11.7 | −0.7929 | .5714 | +.1620 | 0 | −65 |
| *g* Pleiadum | 5½ | 3.81 | 19.7 | 23 54.2 | 4 57.7 | − 9 36.1 | +0.5246 | .5727 | .1578 | +80 | − 2 |
| *b* Pleiadum | 4 | 3.80 | 19.7 | 23 43.6 | 4 59.6 | − 9 34.3 | +0.7091 | .5727 | .1577 | +90 | + 8 |
| *m* Pleiadum | 7 | 3.82 | 19.6 | 24 27.2 | 5 5.8 | − 9 28.3 | −0.0170 | .5728 | .1575 | +44 | −29 |
| *e* Pleiadum | 5 | 3.81 | 19.6 | 24 4.9 | 5 7.3 | − 9 26.9 | +0.3666 | .5729 | .1573 | +67 | −10 |
| *c* Pleiadum | 5 | 3.82 | 19.7 | 23 59.0 | 5 22.4 | − 9 12.4 | +0.5063 | .5731 | .1567 | +78 | − 3 |
| *d* Pleiadum | 5 | +3.80 | +19.7 | +23 33.9 | 5 35.1 | − 9 0.1 | +0.9665 | .5732 | +.1562 | +90 | +24 |
| η Tauri | 3 | 3.80 | 19.5 | 23 43.5 | 6 2.9 | − 8 33.5 | +0.8760 | .5736 | .1550 | +90 | +18 |
| *f* Pleiadum | 4 | 3.79 | 19.5 | 23 40.7 | 6 43.6 | − 7 54.4 | +1.0287 | .5741 | .1532 | +90 | +28 |
| *h* Pleiadum | 5½ | 3.80 | 19.5 | 23 45.7 | 6 44.1 | − 7 53.9 | +0.9447 | .5741 | .1532 | +90 | +22 |
| B. A. C. 1192 | 6 | 3.82 | 19.0 | 25 12.5 | 7 9.8 | − 7 29.1 | −0.4681 | .5744 | .1521 | +19 | −53 |
| *p* Tauri | 6 | 3.83 | 17.4 | 26 9.7 | 15 19.1 | + 0 21.2 | −0.2876 | .5804 | .1301 | +29 | −41 |
| φ Tauri, *mult.* | 5½ | +3.83 | +16.5 | +27 3.4 | 19 2.0 | + 3 55.1 | −0.7362 | .5829 | +.1197 | + 3 | −63 |
| $\chi^1$ Tauri | 5½ | 3.79 | 16.8 | 25 20.4 | 19 56.3 | + 4 47.3 | +1.1215 | .5835 | .1171 | +90 | +39 |
| $\chi^2$ Tauri | 8½ | 3.79 | 16.8 | 25 20.6 | 19 56.5 | + 4 47.5 | +1.1174 | .5835 | .1171 | +90 | +39 |
| B. A. C. 1444 | 6 | 3.83 | 14.7 | 28 22.6 | **7** 3 7.6 | +11 41.3 | −1.2059 | .5878 | .0958 | −37 | −62 |
| B. A. C. 1648 | 6½ | 3.70 | 11.7 | 27 49.9 | 18 11.9 | + 2 8.3 | +0.4384 | .5943 | .0484 | +74 | + 4 |
| B. A. C. 1649 | 6½ | 3.75 | 11.1 | 29 26.6 | 18 14.6 | + 2 10.9 | −1.1956 | .5943 | .0481 | −37 | −61 |
| β Tauri | 2 | +3.71 | +11.0 | +28 30.2 | 20 10.3 | + 4 1.8 | −0.1540 | .5949 | +.0419 | +36 | −26 |
| B. A. C. 1709 | 6½ | 3.71 | 10.6 | 29 5.3 | 21 25.6 | + 5 13.9 | −0.6977 | .5952 | .0376 | + 4 | −59 |
| B. A. C. 1746 | 6½ | 3.65 | 10 5 | 27 35.0 | 23 48.2 | + 7 30.6 | +0.9105 | .5957 | .0298 | +90 | +32 |
| B. A. C. 1772 | 6 | 3.69 | 9.8 | 29 8.7 | **8** 1 1.9 | + 8 41.2 | −0.6408 | .5959 | .0256 | + 8 | −55 |
| 136 Tauri | 5 | 3.59 | 9.2 | 27 35.0 | 6 18.2 | −10 15.7 | +1.0332 | .5966 | .0083 | +90 | +42 |
| B. A. C. 1882 | 6½ | +3.62 | + 8.4 | +28 55 4 | 7 28.7 | − 9 8.1 | −0.3184 | .5966 | +.0043 | +27 | −32 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### OCTOBER.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from **1876.0.** Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle *H* | *Y* | *x′* | *y′* | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| κ Aurigæ | 4½ | +3.57 | + 6.7 | +29 32.6 | **8** 14 29.3 | − 2 25.2 | −0.9993 | .5965 | −.0190 | −17 | −61 |
| B. A. C. 2097 | 6½ | 3.46 | 5.9 | 28 17.6 | 20 7.0 | + 2 58.4 | +0.1075 | .5960 | .0347 | +51 | −12 |
| 49 Aurigæ | 5½ | 3.44 | 5.6 | 28 7.1 | 21 55.8 | + 4 42.7 | +0.2099 | .5954 | .0418 | +57 | − 7 |
| 53 Aurigæ | 6 | 3.46 | 5.0 | 29 5.4 | 23 6.1 | + 5 50.0 | −0.8277 | .5952 | .0475 | − 4 | −61 |
| 54 Aurigæ | 6 | 3.43 | 5.1 | 28 22.3 | 23 33.4 | + 6 16.2 | −0.1224 | .5951 | .0492 | +38 | −25 |
| 28 Geminor. | 6 | 3.43 | 4.4 | 29 5.7 | **9** 1 29.8 | + 8 7.7 | −0.9572 | .5943 | .0554 | −13 | −61 |
| 47 Geminor. | 6 | +3.23 | + 2.7 | +27 3.6 | 11 37.1 | − 6 10.0 | +0.3780 | .5907 | −.0882 | +69 | − 2 |
| 53 Geminor. | 6 | 3.24 | 2.1 | 28 6.7 | 13 20.3 | − 4 31.2 | −0.8431 | .5898 | .0934 | − 4 | −62 |
| 59 Geminor. | 6½ | 3.18 | 1.5 | 27 52.5 | 16 38.4 | − 1 21.1 | −0.9292 | .5882 | .1035 | −10 | −62 |
| ι Geminorum | 4 | 3.19 | 1.3 | 28 2.6 | 17 5.7 | − 0 55.0 | −1.1455 | .5881 | .1047 | −29 | −62 |
| υ Geminorum | 4½ | 3.11 | 0.7 | 27 10.2 | 21 2.8 | + 2 52.6 | −0.6984 | .5857 | .1166 | + 5 | −63 |
| c Geminorum | 6 | 3.08 | + 0.4 | 26 4.6 | **10** 0 15.3 | + 5 57.3 | +0.0183 | .5839 | .1259 | +46 | −24 |
| $\omega^1$ Cancri, *mult.* | 6 | +2.95 | − 0.9 | +25 43.8 | 6 52.4 | −11 41.4 | −0.5254 | .5795 | −.1444 | +16 | −55 |
| $\omega^2$ Cancri | 6½ | 2.93 | 0.8 | 25 25.7 | 7 11.9 | −11 22.7 | −0.2666 | .5793 | .1452 | +30 | −41 |
| $\psi^2$ Cancri | 6 | 2.89 | 1.6 | 25 52.9 | 10 40.0 | − 8 2.7 | −1.2457 | .5769 | .1547 | −39 | −64 |
| λ Cancri | 6 | 2.79 | 1.9 | 24 24.6 | 14 44.8 | − 4 7.4 | −0.4088 | .5739 | .1652 | +22 | −51 |
| $\upsilon^2$ Cancri | 6½ | 2.76 | 2.5 | 24 33.2 | 18 1.4 | − 0 58.4 | −1.1089 | .5715 | .1734 | −22 | −66 |
| $\upsilon^3$ Cancri | 6 | 2.75 | 2.7 | 24 29.8 | 19 12.6 | + 0 10.2 | −1.2581 | .5707 | .1760 | −39 | −66 |
| γ Cancri | 4½ | +2.61 | − 2.7 | +21 54.7 | **11** 0 6.5 | + 4 52.8 | +0.4691 | .5671 | −.1875 | +74 | − 8 |
| 83 Cancri | 6 | 2.34 | 4.2 | 18 13.7 | 15 16.5 | − 4 30.6 | +1.1140 | .5553 | .2295 | +90 | +27 |
| 8 Leonis | 6 | 2.22 | 4.9 | 16 59.5 | 23 10.7 | + 3 6.8 | +0.5838 | .5495 | .2326 | +83 | − 8 |
| 34 Leonis | 6 | 2.00 | 6.3 | 13 57.8 | **12** 14 48.3 | − 5 47.8 | −0.1544 | .5389 | .2546 | +36 | −48 |
| 37 Leonis | 6 | 1.99 | 6.7 | 14 20.6 | 17 7.7 | − 3 33.1 | −1.1363 | .5374 | .2575 | −19 | −76 |
| ρ Leonis | 4 | 1.85 | 6.5 | 9 56.5 | **13** 0 41.2 | + 3 45.5 | +1.3715 | .5331 | .2653 | +96 | +45 |
| VENUS | | | | + 9 28.7 | 2 46.4 | + 5 46.5 | +1.2888 | .4874 | −.2531 | +90 | +32 |
| c Leonis | 5 | +1.69 | − 7.3 | 6 45.9 | 14 0.2 | − 7 21.4 | +1.0125 | .5267 | .2754 | +90 | +11 |
| χ Leonis | 5 | 1.70 | 7.8 | 8 0.2 | 16 4.5 | − 4 21.0 | −0.8262 | .5259 | .2767 | + 2 | −82 |
| τ Leonis | 5 | 1.56 | 8.1 | 3 32.2 | **14** 3 13.8 | + 5 27.1 | +0.6336 | .5221 | .2812 | +85 | −12 |
| 89 Leonis | 6 | 1.55 | 8.5 | 3 44.8 | 6 24.1 | + 8 31.5 | −0.4747 | .5212 | .2820 | +21 | −72 |
| β Virginis | 3½ | 1.49 | 9.0 | 2 27.6 | 14 24.2 | − 7 43.4 | −1.4168 | .5195 | .2829 | −48 | −88 |
| B. A. C. 4043 | 6½ | +1.45 | − 9.2 | + 1 13.1 | 18 36.1 | − 3 39.2 | −1.3271 | .5188 | −.2828 | −34 | −89 |
| B. A. C. 5023 | 6 | 1.47 | 13.9 | −21 56.6 | **18** 17 55.8 | − 7 20.3 | −0.5040 | .5397 | .1769 | + 6 | −77 |
| 42 Libræ | 5½ | 1.59 | 14.0 | 23 25.0 | **19** 4 45.3 | + 3 7.1 | −0.7171 | .5435 | .1540 | − 9 | −90 |
| B. A. C. 5197 | 6 | 1.61 | 14.1 | 24 19.7 | 7 14.3 | + 5 31.0 | −0.1111 | .5443 | .1483 | +23 | −51 |
| b Scorpii | 5 | 1.64 | 14.4 | 25 22.6 | 9 31.2 | + 7 43.3 | +0.6872 | .5451 | .1431 | +65 | − 6 |
| $A^2$ Scorp., *mult.* | 5 | 1.65 | 14.3 | 24 57.5 | 10 42.5 | + 8 52.1 | +0.0681 | .5454 | .1404 | +31 | −41 |
| B. A. C. 5253 | 6 | +1.65 | −14.1 | −24 9.9 | 10 51.2 | + 9 0.5 | −0.8095 | .5455 | −.1401 | −15 | −90 |
| B. A. C. 5255 | 6 | 1.65 | 14.3 | 25 2.7 | 10 58.4 | + 9 7.5 | +0.1230 | .5455 | .1396 | +34 | −38 |
| 3 Scorpii | 6 | 1.65 | 14.2 | 24 52.8 | 11 10.7 | + 9 19.4 | −0.0831 | .5456 | .1394 | +23 | −50 |
| 4 Scorpii | 6 | 1.66 | 14.4 | 25 54.3 | 11 32.1 | + 9 40.0 | +0.9736 | .5457 | .1384 | +64 | +13 |
| B. A. C. 5286 | 6½ | 1.67 | 14.2 | 24 29.1 | 12 56.5 | +11 1.5 | −0.7527 | .5458 | .1352 | −12 | −90 |
| π Scorpii | 3 | 1.67 | 14.3 | 25 45.5 | 13 2.0 | +11 6.8 | +0.6126 | .5461 | .1349 | +61 | −11 |
| B. A. C. 5314 | 6 | +1.71 | −14.3 | −25 31.3 | 15 2.7 | −10 56.7 | +0.0898 | .5466 | −.1303 | +31 | −40 |
| B. A. C. 5347 | 5 | 1.72 | 14.2 | 25 59.8 | 17 9.1 | − 8 54.7 | +0.3343 | .5472 | .1253 | +43 | −26 |
| σ Scorpii | 3½ | 1.78 | 13.9 | 25 17.8 | 22 57.8 | − 3 18.0 | −1.1128 | .5486 | .1112 | −39 | −90 |
| α Scorpii | 1½ | 1.85 | 13.9 | 26 9.5 | **20** 2 34.4 | + 0 11.1 | −0.5638 | .5494 | .1023 | − 5 | −84 |
| τ Scorpii | 3½ | 1.90 | 14.2 | 27 57.6 | 5 22.8 | + 2 53.5 | +1.1179 | .5499 | .0958 | +62 | +26 |
| B. A. C. 5603 | 6½ | 1.96 | 14.1 | 28 16.8 | 9 22.7 | + 6 45.0 | +1.1064 | .5505 | .0852 | +62 | +25 |
| 43 Ophiuchi | 6 | +2.19 | −12.8 | −28 1.4 | **21** 2 10.2 | − 1 3.1 | −0.2377 | .5515 | −.0416 | + 6 | −59 |
| 3 Sagittarii | 5 | 2.34 | 11.5 | 27 47.1 | 12 45.8 | + 9 10.0 | −0.7956 | .5507 | .0139 | −26 | −90 |
| B. A. C. 6063 | 6½ | 2.41 | 11.1 | 28 2.9 | 16 46.1 | −10 58.1 | −0.5411 | .5502 | .0034 | −13 | −83 |
| B. A. C. 6072 | 6½ | 2.44 | 11.3 | 28 44.5 | 17 36.1 | −10 9.9 | +0.2209 | .5500 | −.0013 | +26 | −32 |
| $\gamma^1$ Sagittarii | 4 | 2.49 | 11.3 | 29 35.2 | 20 22.9 | − 7 29.0 | +1.1574 | .5496 | +.0059 | +61 | +32 |
| B. A. C. 6120 | 6½ | +2.48 | −10.8 | −28 24.4 | 21 11.3 | − 6 42.3 | −0.1731 | .5494 | +.0079 | + 6 | −55 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### OCTOBER.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | $Y$ | $x'$ | $y'$ | N'n. | S'n. |
| | | Δα | Δδ | | | | | | | | |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| B. A. C. 6127 | 5 | +2.49 | -10.8 | -28 28.3 | **21** 21 45.5 | - 6 9.3 | -0.0587 | .5492 | +.0096 | +12 | -48 |
| B. A. C. 6190 | 6½ | 2.55 | 10.4 | 28 41.6 | **22** 1 51.6 | - 2 11.9 | +0.2465 | .5482 | .0203 | +29 | -30 |
| B. A. C. 6191 | 6½ | 2.56 | 10.3 | 28 19.6 | 1 52.0 | - 2 11.5 | -0.1565 | .5482 | .0203 | + 8 | -54 |
| B. A. C. 6220 | 6½ | 2.61 | 10.2 | 28 29.4 | 3 54.3 | - 0 13.4 | +0.0692 | .5477 | .0254 | +20 | -41 |
| φ Sagittarii | 3½ | 2.70 | 8.1 | 27 7.1 | 14 28.5 | + 9 58.7 | -1.0330 | .5446 | .0522 | -38 | -90 |
| τ Sagittarii | 3½ | 2.86 | 6.8 | 27 51.1 | **23** 0 3.9 | - 4 45.5 | +0.3914 | .5408 | .0757 | +43 | -23 |
| B. A. C. 6666 | 6 | +2.99 | - 4.9 | -27 14.4 | 10 34.8 | + 5 24.2 | +0.6409 | .5362 | +.1003 | +60 | - 9 |
| B. A. C. 7049 | 6 | 3.23 | + 1.6 | 22 48.8 | **24** 14 59.3 | + 8 53.2 | -0.5551 | .5221 | .1593 | + 2 | -82 |
| 17 Capricorni | 6 | 3.29 | 3.3 | 21 57.7 | 23 11.0 | - 7 10.4 | -0.1134 | .5181 | .1742 | +26 | -51 |
| η Capricorni | 5½ | 3.33 | 5.4 | 20 20.5 | **25** 8 19.7 | + 1 41.4 | -0.2356 | .5138 | .1896 | +22 | -58 |
| 27 Capricorni | 6 | 3.38 | 5.7 | 21 3.1 | 10 54.2 | + 4 11.2 | +1.0380 | .5127 | .1936 | +69 | +15 |
| 30 Capricorni | 6 | 3.34 | 7.1 | 18 30.0 | 15 13.5 | + 8 22.6 | -0.9177 | .5108 | .2004 | -13 | -90 |
| γ Capricorni | 3½ | +3.42 | + 9.6 | -17 13.1 | **26** 2 37.0 | - 4 34.2 | +0.0524 | .5063 | +.2167 | +40 | -42 |
| δ Capricorni | 3 | 3.44 | 10.3 | 16 41.2 | 6 14.0 | - 1 3.6 | +0.2604 | .5051 | .2213 | +51 | -31 |
| ι Aquarii | 4 | 3.49 | 12.4 | 14 28.0 | 16 27.5 | + 8 52.1 | +0.1612 | .5021 | .2336 | +48 | -36 |
| 42 Aquarii | 6 | 3.51 | 13.7 | 13 26.7 | 21 57.5 | - 9 47.5 | +0.3490 | .5008 | .2396 | +59 | -27 |
| 45 Aquarii | 6 | 3.52 | 13.8 | 13 55.3 | 23 7.4 | - 8 39.6 | +1.1460 | .5006 | .2409 | +76 | +20 |
| SATURN | | | | 12 40.5 | **27** 1 16.9 | - 6 33.8 | +0.3123 | .5008 | .2433 | +58 | -29 |
| σ Aquarii | 4½ | +3.51 | +15.7 | -11 18.4 | 5 21.1 | - 2 36.6 | -0.1764 | .4995 | +.2470 | +32 | -54 |
| 58 Aquarii | 6 | 3.53 | 15.6 | 11 32.1 | 5 54.0 | - 2 4.7 | +0.2074 | .4994 | .2475 | +53 | -34 |
| 64 Aquarii | 6½ | 3.54 | 16.3 | 10 40.0 | 9 58.1 | + 1 52.5 | +0.2803 | .4989 | .2512 | +57 | -30 |
| λ Aquarii | 4 | 3.55 | 18.0 | 8 14.0 | 17 7.9 | + 8 50.1 | -0.5309 | .4987 | .2570 | +16 | -77 |
| 78 Aquarii | 6 | 3.55 | 18.1 | 7 51.4 | 18 11.1 | + 9 51.4 | -0.6654 | .4984 | .2577 | + 9 | -89 |
| 81 Aquarii | 6 | 3.56 | 18.6 | 7 43.3 | 21 50.8 | -10 35.0 | +0.1377 | .4984 | .2603 | +50 | -37 |
| 82 Aquarii | 6 | +3.57 | +18.8 | - 7 14.0 | 22 27.9 | - 9 59.0 | -0.2264 | .4984 | +.2607 | +32 | -57 |
| $h^1$ Aquarii | 5½ | 3.59 | 18.8 | 8 21.4 | 23 51.2 | - 8 38.1 | +1.3452 | .4984 | .2617 | +82 | +38 |
| $h^2$ Aquarii | 7 | 3.60 | 18.7 | 8 25.0 | 23 56.6 | - 8 32.8 | +1.4325 | .4984 | .2617 | +82 | +56 |
| φ Aquarii | 4½ | 3.61 | 19.8 | 6 42.7 | **28** 4 46.9 | - 3 50.8 | +0.8710 | .4986 | .2646 | +83 | + 1 |
| 96 Aquarii | 5½ | 3.62 | 20.4 | 5 47.7 | 7 29.7 | - 1 12.5 | +0.6074 | .4989 | .2661 | +80 | -14 |
| B. A. C. 8134 | 6½ | 3.62 | 20.6 | 5 20.7 | 8 33.8 | - 0 10.3 | +0.4089 | .4990 | .2666 | +67 | -24 |
| B. A. C. 8184 | 5½ | +3.64 | +21.1 | - 5 12.2 | 12 55.2 | + 4 3.7 | +1.4213 | .4995 | +.2688 | +85 | +49 |
| 14 Piscium | 6 | 3.60 | 22.2 | 1 55.6 | 15 24.0 | + 6 28.3 | -1.4103 | .5000 | .2699 | -47 | -90 |
| B. A. C. 8311 | 6½ | 3.66 | 23.5 | - 0 34.5 | **29** 2 21.3 | - 6 53.4 | +0.1306 | .5027 | .2731 | +52 | -37 |
| 60 Piscium | 6 | 3.80 | 26.3 | + 6 4.3 | **30** 5 31.8 | - 4 30.8 | +0.5583 | .5148 | .2713 | +79 | -15 |
| 62 Piscium | 6 | 3.79 | 26.4 | 6 37.8 | 5 58.3 | - 4 5.2 | +0.0935 | .5151 | .2711 | +50 | -39 |
| δ Piscium | 4½ | 3.83 | 26.5 | 6 55.0 | 6 10.2 | - 3 53.6 | -0.1524 | .5152 | .2711 | +37 | -51 |
| ε Piscium | 4 | +3.84 | +26.8 | + 7 13.8 | 13 17.5 | + 3 0.5 | +1.4048 | .5196 | +.2679 | +90 | +49 |
| π Piscium | 6 | 3.94 | 27.1 | 11 30.8 | **31** 5 45.7 | - 5 2.6 | +1.3089 | .5319 | .2558 | +90 | +38 |
| 104 Piscium | 6½ | +3.97 | +27.2 | +13 39.9 | 6 44.9 | - 4 5.4 | -0.6575 | .5327 | +.2548 | +10 | -76 |
| **NOVEMBER.** | | | | | | | | | | | |
| 26 Arietis | 6 | +4.15 | +26.2 | +19 18.7 | **1** 5 57.3 | - 5 40.2 | -0.8533 | .5533 | +.2241 | - 2 | -71 |
| 27 Arietis | 6 | 4.13 | 26.3 | 17 9.7 | 6 6.2 | - 5 31.6 | +1.3602 | .5534 | .2240 | +90 | +55 |
| B. A. C. 782 | 6½ | 4.16 | 26.2 | 18 20.4 | 7 15.5 | - 4 24.7 | +0.4288 | .5546 | .2220 | +71 | -14 |
| μ Arietis | 5½ | 4.19 | 25.7 | 19 29.3 | 11 1.3 | - 0 46.9 | +0.0809 | .5581 | .2153 | +49 | -31 |
| 47 Arietis | 6 | 4.23 | 25.0 | 20 10.6 | 17 39.5 | + 5 36.7 | +0.7682 | .5646 | .2027 | +90 | + 6 |
| ε Arietis, *mult.* | 4½ | 4.25 | 25.0 | 20 51.0 | 18 8.0 | + 6 4.1 | +0.1805 | .5649 | .2016 | +55 | -24 |
| 66 Arietis | 6½ | 4.34 | 23.0 | 22 22.9 | **2** 6 5.3 | - 6 25.8 | +0.8827 | .5760 | .1750 | +90 | +16 |
| 7 Tauri, *mult.* | 6 | +4.39 | +22.7 | +24 3.2 | 8 27.8 | - 4 8.8 | -0.3993 | .5781 | +.1692 | +23 | -51 |
| 9 Tauri | 6 | 4.37 | 22.4 | 22 48.3 | 9 29.6 | - 3 9.4 | +1.0349 | .5790 | .1667 | +90 | +27 |
| 11 Tauri | 6 | 4.42 | 22.0 | 24 56.0 | 10 57.8 | - 1 44.5 | -0.8730 | .5803 | .1628 | - 5 | -65 |
| *g* Pleiadum | 5½ | 4.40 | 21.8 | 23 54.2 | 12 34.5 | - 0 11.7 | +0.4261 | .5817 | .1587 | +72 | - 7 |
| *b* Pleiadum | 4 | 4.40 | 21.8 | 23 43.7 | 12 36.4 | - 0 9.9 | +0.6084 | .5817 | .1587 | +88 | + 3 |
| *m* Pleiadum | 7 | +4.42 | +21.7 | +24 27.2 | 12 42.2 | - 0 4.3 | -0.1096 | .5818 | +.1584 | +38 | -34 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### NOVEMBER.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| c Pleiadum | 5 | +4.40 | +21.8 | +24 4.9 | **2** 12 43.8 | − 0 2.8 | +0.2698 | .5820 | +.1582 | +61 | −15 |
| c Pleiadum | 5 | 4.41 | 21.8 | 23 59.1 | 12 58.6 | + 0 11.1 | +0.4075 | .5821 | .1576 | +70 | − 7 |
| *d* Pleiadum | 5 | 4.39 | 21.7 | 23 34.0 | 13 10.9 | + 0 23.3 | +0.8620 | .5822 | .1571 | +90 | +17 |
| η Tauri | 3 | 4.40 | 21.6 | 23 43.6 | 13 38.0 | + 0 49.3 | +0.7713 | .5827 | .1558 | +90 | +12 |
| *f* Pleiadum | 4 | 4.40 | 21.5 | 23 40.7 | 14 17.6 | + 1 27.3 | +0.9217 | .5832 | .1543 | +90 | +21 |
| *h* Pleiadum | 5½ | 4.40 | 21.5 | 23 45.7 | 14 18.1 | + 1 27.8 | +0.8389 | .5832 | .1543 | +90 | +16 |
| B. A. C. 1192 | 6 | +4.43 | +21.3 | +25 12.5 | 14 43.0 | + 1 51.8 | −0.5574 | .5836 | +.1529 | +14 | −58 |
| *p* Tauri | 6 | 4.49 | 19.6 | 26 9.7 | 22 39.1 | + 9 28.6 | −0.3900 | .5897 | .1309 | +23 | −47 |
| φ Tauri, *mult.* | 5½ | 4.52 | 18.6 | 27 3.5 | **3** 2 16.0 | −11 3.3 | −0.8375 | .5925 | .1204 | − 4 | −63 |
| χ¹ Tauri | 5½ | 4.48 | 18.6 | 25 29.4 | 3 8.8 | −10 12.6 | +0.9959 | .5931 | .1176 | +90 | +30 |
| χ² Tauri | 8½ | 4.48 | 18.6 | 25 20.7 | 3 9.0 | −10 12.4 | +0.9911 | .5931 | .1176 | +90 | +29 |
| B. A. C. 1648 | 6½ | 4.54 | 12.7 | 27 50.0 | **4** 0 48.8 | +10 32.8 | +0.2955 | .6033 | .0476 | +63 | − 3 |
| β Tauri | 2 | +4.55 | +12.1 | +28 30.2 | 2 44.3 | −11 36.6 | −0.2925 | .6042 | +.0412 | +28 | −34 |
| B. A. C. 1709 | 6½ | 4.57 | 11.6 | 29 5.3 | 3 57.7 | −10 26.4 | −0.8314 | .6043 | .0370 | − 4 | −61 |
| B. A. C. 1746 | 6½ | 4.51 | 11.3 | 27 35.0 | 6 16.7 | − 8 13.3 | +0.7561 | .5045 | .0292 | +90 | +23 |
| B. A. C. 1772 | 6 | 4.55 | 10.4 | 29 8.7 | 7 28.6 | − 7 4.5 | −0.7787 | .6047 | .0250 | − 1 | −61 |
| 136 Tauri | 5 | 4.46 | 9.3 | 27 35.0 | 12 37.4 | − 2 9.0 | +0.8714 | .6056 | .0071 | +90 | +31 |
| B. A. C. 1882 | 6½ | 4.50 | 8.6 | 28 55.4 | 13 46.3 | − 1 3.1 | −0.4665 | .6054 | +.0033 | +18 | −41 |
| κ Aurigæ | 4½ | +4.49 | + 6.4 | +29 32.6 | 20 37.6 | + 5 30.5 | −1.1476 | .6042 | −.0204 | −31 | −61 |
| B. A. C. 2097 | 6½ | 4.39 | 5.3 | 28 17.5 | **5** 2 8.2 | +10 47.6 | −0.0572 | .6029 | .0392 | +41 | −20 |
| 49 Aurigæ | 5½ | 4.37 | 4.8 | 28 7.1 | 3 55.0 | −11 30.8 | +0.0427 | .6024 | .0459 | +47 | −16 |
| 53 Aurigæ | 6 | 4.40 | 4.3 | 29 5.4 | 5 3.9 | −10 24.8 | −0.9865 | .6020 | .0491 | −15 | −61 |
| 54 Aurigæ | 6 | 4.37 | 4.3 | 28 22.3 | 5 30.7 | − 9 59.1 | −0.2881 | .6018 | .0504 | +28 | −34 |
| 28 Geminor. | 6 | 4.36 | 3.5 | 29 5.7 | 7 24.9 | − 8 9.8 | −1.1169 | .6011 | .0571 | −27 | −61 |
| 47 Geminor. | 6 | +4.18 | + 1.2 | +27 3.5 | 17 22.0 | + 1 22.1 | +0.1987 | .5961 | −.0894 | +57 | −12 |
| 53 Geminor. | 6 | 4.20 | + 0.1 | 28 6.7 | 19 3.8 | + 2 59.7 | −1.0148 | .5951 | .0947 | −17 | −62 |
| 59 Geminor. | 6½ | 4.15 | − 0.5 | 27 52.5 | 22 19.1 | + 6 7.0 | −1.1031 | .5930 | .1051 | −25 | −62 |
| υ Geminorum | 4½ | 4.07 | 1.4 | 27 10.1 | **6** 2 40.1 | +10 17.3 | −0.8776 | .5899 | .1179 | − 6 | −63 |
| c Geminorum | 6 | 4.00 | 1.9 | 26 4.6 | 5 50.5 | −10 40.1 | −0.1675 | .5876 | .1271 | +35 | −34 |
| κ Geminorum | 3½ | 3.96 | 1.5 | 24 41.6 | 6 0.0 | −10 31.0 | +1.2059 | .5875 | .1274 | +90 | +46 |
| ω¹ Cancri, *mult.* | 6 | +3.89 | − 3.7 | +25 43.8 | 12 24.0 | − 4 22.4 | −0.7129 | .5825 | −.1452 | + 4 | −65 |
| ω² Cancri | 6½ | 3.87 | 3.6 | 25 25.7 | 12 43.3 | − 4 3.9 | −0.4553 | .5822 | .1464 | +19 | −52 |
| λ Cancri | 6 | 3.75 | 5.4 | 24 24.6 | 20 13.3 | + 3 8.4 | −0.6909 | .5757 | .1659 | +11 | −61 |
| υ² Cancri | 6½ | 3.70 | 6.0 | 24 33.2 | 23 29.1 | + 6 16.7 | −1.3005 | .5729 | .1738 | −47 | −66 |
| γ Cancri | 4½ | 3.53 | 6.5 | 21 54.7 | **7** 5 33.2 | −11 53.1 | +0.2715 | .5675 | .1879 | +60 | −18 |
| 80 Cancri | 6½ | 3.27 | 7.9 | 18 32.9 | 17 41.7 | − 0 11.4 | −1.2451 | .5566 | .2125 | +90 | +39 |
| 83 Cancri | 6 | 3.22 | 8.4 | 18 13.6 | 20 44.7 | + 2 45.0 | +0.9154 | .5539 | .2181 | +90 | +13 |
| 8 Leonis | 6 | +3.19 | − 9.3 | +16 59.5 | **8** 4 41.7 | +10 25.2 | +0.3864 | .5473 | −.2313 | +67 | −17 |
| 34 Leonis | 6 | 2.79 | 10.9 | 13 57.8 | 20 28.7 | + 1 40.0 | −0.3490 | .5350 | .2522 | +26 | −59 |
| 37 Leonis | 6 | 2.78 | 11.5 | 14 20.5 | 22 49.9 | + 3 56.5 | −1.3344 | .5332 | .2549 | −39 | −76 |
| 45 Leonis | 6 | 2.64 | 10.8 | 10 23.4 | **9** 4 2.2 | + 8 58.6 | +1.3712 | .5299 | .2599 | +90 | +46 |
| ρ Leonis | 4 | 2.61 | 11.2 | 9 56.4 | 6 29.8 | +11 21.4 | +1.1912 | .5285 | .2621 | +90 | +26 |
| *c* Leonis | 5 | 2.40 | 11.8 | 6 45.8 | 20 2.0 | + 0 27.7 | +0.8431 | .5213 | .2716 | +90 | + 1 |
| χ Leonis | 5 | 2.40 | 12.5 | 8 0.1 | 22 8.5 | + 2 30.2 | −1.0062 | .5204 | .2727 | − 9 | −82 |
| τ Leonis | 5 | +2.22 | −12.3 | + 3 32.1 | **10** 9 30.5 | −10 28.8 | +0.4781 | .5163 | −.2768 | +73 | −20 |
| 89 Leonis | 6 | 2.19 | 12.7 | + 3 44.7 | 12 44.6 | − 7 20.7 | −0.6355 | .5153 | .2775 | +12 | −84 |
| B. A. C. 4200 | 6 | 1.89 | 12.9 | − 3 55.9 | **11** 15 48.6 | − 5 5.6 | −0.1570 | .5123 | .2746 | +36 | −53 |
| B. A. C. 4225 | 6½ | 1.88 | 12.9 | 4 22.3 | 17 43.7 | − 3 13.9 | −0.2237 | .5124 | .2736 | +33 | −57 |
| *f* Virginis | 6 | 1.85 | 12.9 | 5 9.1 | 20 20.4 | − 0 42.0 | −0.1215 | .5126 | .2724 | +37 | −51 |
| 28 Virginis | 6 | 1.83 | 12.7 | 6 49.3 | 22 57.3 | + 1 50.2 | +0.9166 | .5129 | .2709 | +83 | + 4 |
| B. A. C. 4294 | 6½ | 1.83 | 13.3 | 5 37.6 | **12** 1 47.7 | + 4 35.4 | −1.1036 | .5132 | .2695 | −17 | −90 |
| ψ Virginis | 5 | +1.78 | −12.7 | − 8 52.1 | 5 13.2 | + 7 54.8 | +1.3785 | .5137 | −.2673 | +81 | +43 |
| *g* Virginis | 6 | 1.74 | 12.9 | 10 4.8 | 12 2.4 | − 9 28.4 | +0.8476 | .5150 | .2623 | +80 | 0 |
| B. A. C. 4394 | 6 | 1.75 | 13.4 | 8 19.4 | 12 22.8 | − 9 8.6 | −1.0912 | .5151 | .2621 | −17 | −90 |
| 50 Virginis | 6 | 1.73 | 13.2 | 9 40.3 | 12 58.7 | − 8 33.8 | +0.1710 | .5153 | .2618 | +51 | −36 |
| 58 Virginis | 6 | 1.71 | 13.3 | 9 53.8 | 16 50.7 | − 4 48.9 | −0.5974 | .5163 | .2583 | +12 | −82 |
| α Virginis | 1 | 1.69 | 13.3 | 10 31.0 | 20 42.3 | − 1 4.3 | −0.9335 | .5163 | .2548 | − 8 | −90 |
| *i* Virginis | 6 | +1.68 | −13.1 | −12 3.9 | 21 27.5 | − 0 20.5 | +0.5093 | .5175 | −.2549 | +70 | −18 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### NOVEMBER.

| STARS— | | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| B. A. C. 4531 | 6 | +1.67 | −13.3 | −12 34.9 | 13 1 24.3 | + 3 29.1 | +0.0602 | .5188 | −.2500 | +44 | −41 |
| B. A. C. 5800 | 6½ | 2.02 | 11.6 | 26 50.6 | 17 6 13.2 | + 4 56.1 | −1.2006 | .5541 | .0815 | +52 | −90 |
| 43 Ophiuchi | 6 | 2.06 | 11.3 | 28 1.4 | 10 10.0 | + 8 44.4 | −0.0816 | .5542 | .0402 | +14 | −49 |
| 3 Sagittarii | 5 | 2.15 | 10.4 | 27 47.1 | 20 43.6 | − 5 4.4 | −0.6229 | .5535 | .0123 | −17 | −90 |
| B. A. C. 6063 | 6½ | 2.20 | 10.2 | 28 2.8 | 18 0 43.3 | − 1 13.1 | −0.3616 | .5531 | −.0018 | + 5 | −68 |
| B. A. C 6072 | 6½ | 2.24 | 10.1 | 28 44.5 | 1 33.0 | − 0 25.2 | +0.4020 | .5527 | +.0003 | +37 | −22 |
| B. A. C. 6120 | 6½ | +2.26 | − 9.8 | −28 22.3 | 5 7.6 | + 3 1.8 | +0.0076 | .5520 | +.0098 | +15 | −44 |
| B. A. C 6127 | 5 | 2.27 | 9.7 | 28 28.3 | 5 41.7 | + 3 34.7 | +0.1285 | .5519 | .0111 | +22 | −37 |
| B. A. C. 6190 | 6½ | 2.32 | 9.1 | 28 41.6 | 9 47.1 | + 7 31.5 | +0.4398 | .5509 | .0191 | +41 | −19 |
| B. A. C. 6191 | 6½ | 2.31 | 9.1 | 28 19.6 | 9 47.5 | + 7 31.9 | +0.0368 | .5509 | .0191 | +18 | −42 |
| B. A. C. 6220 | 6½ | 2.37 | 8.8 | 28 29.4 | 11 49.5 | + 9 29.6 | +0.2653 | .5503 | .0271 | +31 | −29 |
| φ Sagittarii | 3½ | 2.42 | 7.3 | 27 7.1 | 22 22.2 | + 4 19.7 | −0.8228 | .5468 | .0537 | −24 | −90 |
| τ Sagittarii | 6 | +2.55 | − 6.1 | −27 51.1 | 19 7 56.8 | + 4 55.1 | +0.6156 | .5427 | +.0771 | +57 | − 9 |
| B. A. C. 6562 | 6½ | 2.56 | 5.2 | 26 6.9 | 10 50.9 | + 7 43.3 | −1.0725 | .5414 | .0841 | −38 | −90 |
| B. A. C. 6666 | 6 | 2.64 | 4.7 | 27 14.3 | 18 27.7 | − 8 55.2 | +9.8792 | .5375 | .1015 | +63 | + 7 |
| $h^2$ Sagittarii | 4½ | 2.63 | − 3.6 | 25 9 4 | 21 41.0 | − 5 48.3 | −1.0912 | .5358 | .1086 | −36 | −90 |
| B. A. C. 7049 | 6 | 2.85 | + 1.0 | 22 48.1 | 20 22 58.0 | − 5 20.3 | −0.2898 | .5215 | .1597 | +16 | −61 |
| 17 Capricorni | 6 | 2.90 | 2.5 | 21 57.8 | 21 7 13.2 | − 2 39.5 | +0.1600 | .5168 | .1743 | +40 | −36 |
| 20 Capricorni | 6 | +2.92 | + 4.2 | −19 30.8 | 14 1.5 | + 9 15.3 | −1.3286 | .5130 | +.1854 | −53 | −90 |
| η Capricorni | 5½ | 2.95 | 4.4 | 20 20.6 | 16 26.9 | +11 36.4 | +0.0437 | .5117 | .1891 | +36 | −42 |
| 27 Capricorni | 6 | 3.00 | 5.2 | 21 3.1 | 19 3.0 | − 9 52.2 | +1.3246 | .5104 | .1931 | +69 | +46 |
| 30 Capricorni | 6 | 2.98 | 6.0 | 18 30.0 | 23 25.1 | − 5 37.9 | −0.6386 | .5082 | .1976 | + 3 | −88 |
| 31 Capricorni | 6½ | 2.97 | 6.2 | 17 58.7 | 23 35.1 | − 5 28.2 | −1.1839 | .5081 | .1998 | −32 | −90 |
| γ Capricorni | 3½ | 3.06 | 8.1 | 17 13.1 | 22 10 57.4 | + 5 34.1 | +0.3410 | .5030 | .2151 | +55 | −27 |
| 45 Capricorni | 6 | +3.04 | + 9.1 | −15 19.0 | 13 4.3 | + 7 37.3 | −1.2993 | .5020 | +.2177 | −41 | −90 |
| δ Capricorni | 3 | 3.09 | 9.0 | 16 41.2 | 14 37.5 | + 9 7.9 | +0.5509 | .5016 | .2191 | +68 | −16 |
| ι Aquarii | 4 | 3.13 | 11.0 | 14 28.0 | 23 1 0.5 | − 4 47.1 | +0.4521 | .4980 | .2314 | +64 | −21 |
| 42 Aquarii | 6 | 3.16 | 12.0 | 13 26.8 | 6 36.0 | + 0 38.9 | +0.6403 | .4964 | .2371 | +76 | −11 |
| SATURN | | | | 12 31.2 | 10 31.6 | + 4 27.9 | +0.5703 | .4995 | .2427 | −73 | −15 |
| σ Aquarii | 4½ | 3.19 | 13.9 | 11 18.5 | 14 7.5 | + 7 57.8 | +0.1093 | .4945 | .2441 | +47 | −39 |
| 58 Aquarii | 6 | +3.20 | +13.9 | −11 32.2 | 14 41.0 | + 8 30.3 | +0.4959 | .4954 | +.2446 | +69 | −19 |
| 64 Aquarii | 6½ | 3.23 | 14.6 | 10 40.1 | 18 49.6 | −11 28.1 | +0.5674 | .4938 | .2480 | +74 | −15 |
| λ Aquarii | 4 | 3.25 | 16.5 | 8 14.1 | 24 2 7.5 | − 4 22.4 | −0.2538 | .4931 | .2534 | +30 | −59 |
| 78 Aquarii | 6 | 3.25 | 16.7 | 7 51.5 | 3 12.0 | − 3 19.7 | −0.3905 | .4930 | .2541 | +23 | −67 |
| 81 Aquarii | 6 | 3.28 | 17.1 | 7 43.3 | 6 55.9 | + 0 18.0 | +0.4154 | .4929 | .2566 | +66 | −23 |
| 82 Aquarii | 6 | 3.28 | 17.4 | 7 14.1 | 7 33.7 | + 0 54.7 | +0.0482 | .4928 | .2569 | +46 | −42 |
| φ Aquarii | 4½ | 3.33 | 18.2 | 6 42.7 | 14 0.1 | + 7 10.3 | −1.1484 | .4930 | .2606 | +84 | +19 |
| B. A. C. 8094 | 6 | +3 30 | +19.2 | − 4 9.9 | 14 42.2 | + 7 51.3 | −1.4233 | .4931 | +.2610 | −51 | −90 |
| 96 Aquarii | 5½ | 3.34 | 18.8 | 5 47.8 | 16 46.0 | + 9 51.7 | +0.8800 | .4933 | .2620 | +84 | + 2 |
| B. A. C. 8134 | 6½ | 3.35 | 19.1 | 5 20.7 | 17 51.5 | +10 55.4 | +0.6789 | .4934 | .2625 | +85 | −10 |
| 11 Piscium | 6½ | 3.35 | 20.5 | 2 28.0 | 22 16.6 | − 8 46.9 | −1.2578 | .4940 | .2645 | −28 | −90 |
| 14 Piscium | 6 | 3.36 | 20.9 | − 1 55.6 | 25 0 49.5 | − 6 18.2 | −1.1628 | .4945 | .2655 | −20 | −90 |
| 21 Piscium | 6 | 3.40 | 22.4 | + 0 23.6 | 9 7.5 | + 1 45.8 | −1.4309 | .4964 | .2681 | −52 | −90 |
| B. A. C. 8311 | 6½ | 3.45 | 22.2 | − 0 34.5 | 11 59.2 | + 4 32.6 | +0.3740 | .4973 | .2688 | +65 | −25 |
| 60 Piscium | 6 | +3.69 | +25.9 | + 6 4.3 | 26 15 35 9 | + 7 21.3 | +0.7523 | .5105 | +.2672 | +90 | − 5 |
| 62 Piscium | 6 | 3.68 | 26.0 | 6 37.8 | 16 2.7 | + 7 47.3 | +0.2842 | .5108 | .2670 | +69 | −29 |
| δ Piscium | 4½ | 3.69 | 26.1 | 6 55.0 | 16 14.7 | + 7 58.9 | +0.0365 | .5110 | .2670 | +46 | −41 |
| 101 Piscium | 6 | 3.94 | 27.0 | 14 2.1 | 27 15 24.3 | + 6 25.5 | −1.3274 | .5290 | .2530 | −39 | −76 |
| 104 Piscium | 6½ | 3.97 | 27.8 | 13 39.9 | 17 3.2 | + 8 1.1 | −0.5278 | .5305 | .2514 | +17 | −69 |
| 26 Arietis | 6 | 4.30 | 27.4 | 19 18.7 | 28 16 17 0 | + 6 27.7 | −0.7813 | .5538 | .2220 | + 2 | −65 |
| B. A. C. 782 | 6½ | 4.31 | 27.1 | 18 20.4 | 17 35.0 | + 7 42.8 | +0.4945 | .5552 | .2198 | +76 | −10 |
| ν Arietis | 5½ | +4.36 | +26.9 | +19 29.4 | 21 19.7 | +11 19.6 | +0.1373 | .5593 | +.2132 | +52 | −28 |
| 47 Arietis | 6 | 4.45 | 26.2 | 20 10.6 | 29 3 55.1 | − 6 19.6 | +0.8041 | .5666 | .2005 | +90 | + 9 |
| ε Arietis | 4½ | 4.48 | 26.1 | 20 51.0 | 4 23.4 | − 5 52.3 | +0.2177 | .5670 | .1998 | +57 | −22 |
| 66 Arietis | 6½ | 4.64 | 24.5 | 22 22.9 | 16 13.1 | + 5 30.2 | +0.8835 | .5799 | .1732 | +90 | +17 |
| 7 Tauri, *mult.* | 6 | 4.72 | 24.2 | 24 3.2 | 18 33.6 | + 7 45.2 | −0.3960 | .5823 | .1677 | +23 | −50 |
| 9 Tauri | 6 | 5.69 | 23.8 | 22 48.3 | 19 34.5 | + 8 43 6 | +1.0252 | .5836 | .1652 | +90 | +27 |
| 11 Tauri | 6 | +4.76 | +23.6 | +24 56.0 | 21 1.4 | +10 7.2 | −0.8728 | .5849 | +.1615 | − 5 | −65 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x′ | y′ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| **NOVEMBER.** | | | | | | | | | | | |
| *g* Pleiadum | 5½ | +4.76 | +23.4 | +23 54.2 | **29** 22 36.6 | +11 38.5 | +0.4125 | .5864 | +.1576 | +71 | − 7 |
| *b* Pleiadum | 4 | 4.75 | 23.4 | 23 43.7 | 22 38.5 | +11 49.3 | +0.5933 | .5866 | .1573 | +86 | + 2 |
| *m* Pleiadum | 7 | 4.77 | 23.2 | 24 27.3 | 22 44.3 | +11 45.9 | −0.1191 | .5866 | .1571 | +38 | −34 |
| *e* Pleiadum | 5 | 4.76 | 23.3 | 24 5.0 | 22 45.8 | +11 47.3 | +0.2572 | .5866 | .1570 | +60 | −15 |
| *c* Pleiadum | 5 | 4.76 | 23.3 | 23 59.1 | 23 0.3 | −11 58.7 | +0.3929 | .5868 | .1565 | +69 | − 8 |
| *d* Pleiadum | 5 | 4.75 | 23.2 | 23 34.0 | 23 12.4 | −11 47.1 | +0.8433 | .5870 | .1559 | +90 | +16 |
| *η* Tauri | 3 | 4.76 | 23.1 | 23 43.6 | 23 39.1 | −11 21.5 | +0.7525 | .5875 | .1546 | +90 | +11 |
| *f* Pleiadum | 4 | +4.77 | +23.1 | +23 40.7 | **30** 0 18.1 | −10 44.1 | +0.8997 | .5880 | +.1530 | +90 | +20 |
| *h* Pleiadum | 5½ | 4.77 | 23.1 | 23 45.7 | 0 18.5 | −10 43.7 | +0.8173 | .5880 | .1530 | +90 | +15 |
| B. A. C. 1192 | 6 | 4.81 | 23.0 | 25 12.5 | 0 43 1 | −10 20.0 | −0.5687 | .5885 | .1517 | +13 | −58 |
| *p* Tauri | 6 | 4.95 | 21.2 | 26 9.7 | 8 30.7 | − 2 51.7 | −0.4221 | .5958 | .1297 | +21 | −48 |
| *φ* Tauri, *mult.* | 5½ | 5.00 | 20.3 | 27 3.5 | 12 3.3 | + 0 32.1 | −0.8742 | .5989 | .1191 | − 6 | −63 |
| *χ*¹ Tauri | 5½ | 4.95 | 20.0 | 25 20.4 | 12 54.9 | + 1 21.6 | +0.9391 | .5999 | .1164 | +90 | +26 |
| *χ*² Tauri | 8½ | +4.95 | +20.0 | +25 20.7 | 12 55.2 | + 1 21.9 | +0.9337 | .5999 | +.1164 | +90 | +26 |
| **DECEMBER.** | | | | | | | | | | | |
| B. A. C. 1648 | 6½ | +5.19 | +13.5 | +27 50.0 | **1** 10 3.6 | − 2 24.5 | +0.1931 | .6126 | +.0461 | +56 | − 8 |
| *β* Tauri | 2 | 5.21 | 12.9 | 28 30.2 | 11 55.8 | − 0 37.2 | −0.3912 | .6132 | .0429 | +22 | −39 |
| B. A. C. 1709 | 6½ | 5.23 | 12.5 | 29 5 3 | 13 7.3 | + 0 31.1 | −0.9255 | .6141 | .0351 | −11 | −61 |
| B. A. C. 1746 | 6½ | 5.19 | 11.9 | 27 35.0 | 15 22.5 | + 2 40.4 | +0.6349 | .6144 | .0273 | +90 | +16 |
| B. A. C. 1772 | 6 | 5.25 | 11.3 | 29 8.7 | 16 32.3 | + 3 47.1 | −0.8812 | .6146 | .0230 | − 8 | −61 |
| 136 Tauri | 5 | 5.19 | 9.8 | 27 35.0 | 21 32.1 | + 8 33.6 | +0.7337 | .6153 | .0050 | +90 | +23 |
| B. A. C. 1882 | 6½ | 5.23 | + 9.3 | +28 55.4 | 22 38.9 | + 9 37.4 | −0.5873 | .6154 | +.0009 | +11 | −49 |
| B. A. C. 2097 | 6½ | 5.19 | 4.9 | 28 17.5 | **2** 10 38.1 | − 2 55.2 | −0.2102 | .6137 | −.0421 | +32 | −29 |
| 49 Aurigæ | 5½ | 5.19 | 4.3 | 28 7.1 | 12 21.4 | − 1 16.5 | −0.1158 | .6133 | .0481 | +38 | −24 |
| 53 Aurigæ | 6 | 5.23 | 3.8 | 29 5.4 | 13 28.2 | − 0 12.6 | −1.1311 | .6129 | .0520 | −29 | −61 |
| 54 Aurigæ | 6 | 5.19 | 3.7 | 28 22.3 | 13 54.1 | + 0 12.1 | −0.4446 | .6127 | .0534 | +19 | −43 |
| 28 Geminor. | 6 | 5.21 | 2.9 | 29 5.7 | 15 44.7 | + 1 57.8 | −1.2642 | .6121 | .0604 | −51 | −61 |
| 39 Geminor. | 6½ | +5.07 | + 1.6 | +26 14.6 | 20 50.9 | + 6 50.6 | +1.2031 | .6098 | −.0776 | +90 | +51 |
| 47 Geminor. | 6 | 5.06 | − 0.1 | 27 3.5 | **3** 1 22.7 | +11 10.6 | +0.0104 | .6070 | .0928 | +45 | −22 |
| 53 Geminor. | 6 | 5.10 | 0.8 | 28 6.6 | 3 1.1 | −11 15.3 | −1.1874 | .6060 | .0984 | −34 | −62 |
| 59 Geminor. | 6½ | 5.04 | 1.8 | 27 52.5 | 6 10.2 | − 8 14.2 | −1.2806 | .6039 | .1085 | −51 | −62 |
| *υ* Geminorum | 4½ | 4.97 | 3.3 | 27 10.1 | 10 22.9 | − 4 12.4 | −1.0666 | .6008 | .1218 | −21 | −63 |
| *c* Geminorum | 6 | 4.91 | 4.1 | 26 4.6 | 13 27.2 | − 1 15.7 | −0.3740 | .5983 | .1311 | +24 | −45 |
| *κ* Geminorum | 3½ | +4.87 | − 3.8 | +24 41.5 | 13 36.3 | − 1 7.0 | +0.9777 | .5983 | −.1314 | +90 | +28 |
| *ω*¹ Cancri, *mult.* | 6 | 4.84 | 5.9 | 25 43.7 | 19 48.2 | + 4 49.5 | −0.9228 | .5929 | .1495 | − 9 | −65 |
| *ω*² Cancri | 6½ | 4.81 | 6.0 | 25 25.6 | 20 6.0 | + 5 6.5 | −0.6700 | .5926 | .1503 | + 7 | −64 |
| *λ* Cancri | 6 | 4.69 | 8.0 | 24 24.5 | **4** 3 23.2 | −11 54.0 | −0.8266 | .5857 | .1700 | − 2 | −66 |
| *γ* Cancri | 4½ | 4.47 | 10.2 | 21 54.6 | 12 26.7 | − 3 12.0 | +0.0177 | .5766 | .1920 | +45 | −31 |
| 80 Cancri | 6½ | 4.21 | 12.2 | 18 32.9 | **5** 0 15.5 | + 8 9.9 | +0.9614 | .5645 | .2164 | +90 | +16 |
| 83 Cancri | 6 | +4.17 | −12.8 | +18 13.6 | 3 14.0 | +11 1.8 | +0.6331 | .5615 | −.2220 | +88 | − 3 |
| 8 Leonis | 6 | 4.02 | 14.2 | 16 59.4 | 10 59.7 | − 5 29.4 | +0.1019 | .5538 | .2337 | +50 | −32 |
| Uranus | | | | 13 58.7 | 19 18.3 | + 2 31.7 | +1.1439 | .5493 | .2479 | +90 | +25 |
| *σ* Leonis | 1½ | 3.72 | 15.5 | 12 34.1 | **6** 1 0.5 | + 8 2.2 | +1.1408 | .5411 | .2531 | +90 | +23 |
| 34 Leonis | 6 | 3.72 | 16.3 | 13 57.7 | 2 27.9 | + 9 26.7 | −0.6387 | .5399 | .2547 | +11 | −75 |
| 45 Leonis | 6 | 3.57 | 16.4 | 10 23.3 | 9 54.2 | − 7 22.0 | +1.0629 | .5340 | .2618 | +90 | +16 |
| *ρ* Leonis | 4 | +3.51 | −16.6 | + 9 56.3 | 12 19.7 | − 5 1.2 | +0.8843 | .5321 | −.2639 | +90 | + 5 |
| 49 Leonis | 6 | 3.49 | 16.5 | 9 17.1 | 13 23.1 | − 4 0.0 | +1.2703 | .5313 | .2647 | +90 | +33 |
| *c* Leonis | 5 | 3.30 | 17.4 | 6 45.7 | **7** 1 42.7 | + 7 55.8 | +0.5387 | .5234 | .2722 | +77 | −16 |
| *χ* Leonis | 5 | 3.29 | 18.2 | 8 0.0 | 3 48.2 | + 9 57.4 | −1.3005 | .5222 | .2731 | −33 | −82 |
| *τ* Leonis | 5 | 3.09 | 17.9 | 3 32.0 | 15 6.1 | − 3 5.8 | +0.1809 | .5168 | .2762 | +54 | −35 |
| 89 Leonis | 6 | 3.05 | 18.3 | + 3 44.6 | 18 19.4 | + 0 1.6 | −0.9270 | .5156 | .2767 | − 4 | −87 |
| B. A. C. 4200 | 6 | +2.71 | −17.9 | − 3 56.0 | **8** 21 25.6 | + 2 18.8 | −0.4225 | .5101 | −.2718 | +22 | −69 |
| B. A. C. 4225 | 6½ | 2.69 | 18.0 | 4 22.4 | 23 21.3 | + 4 11.0 | −0.4865 | .5101 | .2708 | +19 | −73 |
| *f* Virginis | 6 | 2.66 | 17.9 | 5 9.2 | **9** 1 59.0 | + 6 44.1 | −0.3796 | .5101 | .2695 | +24 | −66 |
| 28 Virginis | 6 | 2.63 | 17.4 | 6 49.4 | 4 37.0 | + 9 17.3 | +0.6643 | .5101 | .2681 | +83 | −10 |
| B. A. C. 4294 | 6½ | 2.61 | 18.1 | 5 37.6 | 7 28.5 | −11 56.3 | −1.3558 | .5102 | .2663 | −40 | −90 |
| *ψ* Virginis | 5 | +2.55 | −17.2 | − 8 52.2 | 10 55.7 | − 8 35.3 | +1.1387 | .5105 | −.2640 | +81 | +19 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### DECEMBER.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Red'ns from 1876.0. Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle $H$ | Y | $x'$ | $y'$ | N'n. | S'n. |
| | | s | ″ | ° ′ | d h m | h m | | | | ° | ° |
| *g* Virginis | 6 | +2.50 | -17.1 | -10 4.9 | **9** 17 48.6 | - 1 54.7 | +0.6197 | .5116 | -.2588 | +78 | -12 |
| B. A. C. 4394 | 6 | 2.50 | 17.6 | 8 19.4 | 18 9.2 | - 1 34.8 | -1.3253 | .5117 | .2585 | -38 | -90 |
| 50 Virginis | 6 | 2.49 | 17.2 | 9 40.3 | 18 45.4 | - 0 59.7 | -0.0569 | .5118 | .2580 | +39 | -47 |
| 58 Virginis | 6 | 2.47 | 17.3 | 9 53.8 | 22 39.8 | + 2 47.6 | -0.8209 | .5126 | .2546 | - 1 | -90 |
| δ Virginis | 1 | 2.43 | 17.3 | 10 31.1 | **10** 2 33.8 | + 6 34.6 | -1.1505 | .5135 | .2508 | -23 | -90 |
| *i* Virginis | 6 | 2.43 | 16.8 | 12 4.0 | 3 19.5 | + 7 18.9 | +0.2998 | .5138 | .2500 | +57 | -29 |
| B. A. C. 4531 | 6 | +2.40 | -16.8 | -12 34.9 | 7 19.0 | +11 11.2 | -0.1427 | .5148 | -.2459 | +33 | -52 |
| 85 Virginis | 6 | 2.38 | 16.3 | 15 8.9 | 12 44.7 | - 7 33.1 | +1.2682 | .5165 | .2398 | +75 | +31 |
| B. A. C. 4700 | 6 | 2.31 | 16.3 | 15 43.2 | **11** 1 13.2 | + 4 32.3 | -1.0165 | .5212 | .2238 | -17 | -90 |
| B. A. C. 4722 | 6 | 2.28 | 15.8 | 17 37.5 | 3 25.8 | + 6 40.8 | +0.5311 | .5221 | .2206 | +66 | -16 |
| B. A. C. 4739 | 6½ | 2.28 | 15.7 | 18 8.7 | 4 59.7 | + 8 11.8 | +0.7437 | .5229 | .2185 | +71 | - 5 |
| B. A. C. 4923 | 6 | 2.22 | 15.0 | 20 51.5 | 23 30.1 | + 2 6.7 | -0.1076 | .5313 | .1881 | +27 | -51 |
| B. A. C. 5023 | 6 | +2.22 | -14.8 | -21 56.6 | **12** 8 25.4 | +10 44.5 | -0.5395 | .5357 | -.1712 | + 4 | -80 |
| 42 Libræ | 5½ | 2.22 | 14.0 | 23 25.0 | 19 24.6 | - 2 38.2 | -0.7037 | .5407 | .1487 | - 8 | -90 |
| B. A. C. 5197 | 6 | 2.22 | 13.7 | 24 19.7 | 21 55.6 | - 0 12.3 | -0.0818 | .5418 | .1431 | +24 | -49 |
| *b* Scorpii | 5 | 2.22 | 13.5 | 25 22.6 | **13** 0 14.2 | + 2 1.6 | +0.7327 | .5428 | .1380 | +65 | - 3 |
| $A^2$ Scorpii | 5 | 2.22 | 13.5 | 24 57.5 | 1 26.4 | + 3 11.4 | +0.1139 | .5433 | .1354 | +33 | -38 |
| B. A. C. 5253 | 6 | 2.22 | 13.6 | 24 9.9 | 1 35.9 | + 3 20.6 | -0.7704 | .5434 | .1352 | -13 | -90 |
| B. A. C. 5255 | 6 | +2.22 | -13.4 | -25 2.6 | 1 42.4 | + 3 26.8 | +0.1707 | .5434 | -.1349 | +36 | -37 |
| 3 Scorpii | 6 | 2.22 | 13.5 | 24 52.8 | 1 55.3 | + 3 39.2 | -0.0369 | .5435 | .1343 | +25 | -47 |
| 4 Scorpii | 6 | 2.23 | 13.4 | 25 54.2 | 2 16.5 | + 3 59.8 | +1.0301 | .5437 | .1336 | +61 | +17 |
| B. A. C. 5286 | 6½ | 2.21 | 13.5 | 24 29.1 | 3 41.8 | + 5 22.2 | -0.7023 | .5843 | .1305 | -10 | -90 |
| π Scorpii | 3 | 2.22 | 13.3 | 25 45.5 | 3 47.3 | + 5 27.5 | +0.6734 | .5843 | .1303 | +63 | - 7 |
| B. A. C. 5314 | 6 | 2.22 | 13.2 | 25 31.4 | 5 49.4 | + 7 25.4 | +0.1561 | .5451 | -.1254 | +34 | -36 |
| B. A. C. 6666 | 6 | +2.58 | - 3.8 | -27 14.3 | **17** 1 32.7 | - 0 2.6 | +1.0651 | .5389 | +.1038 | +63 | +21 |
| $h^1$ Sagittarii | 6 | 2.57 | 3.0 | 24 59.4 | 4 27.7 | + 2 46.6 | -1.1197 | .5373 | .1102 | -39 | -90 |
| $h^2$ Sagittarii | 4½ | 2.57 | - 2.9 | 25 9.4 | 4 46.2 | + 3 4.4 | -0.9007 | .5371 | .1109 | -23 | -90 |
| B. A. C. 7049 | 6 | 2.68 | + 1.0 | 22 48.0 | **18** 6 5.0 | + 3 34.3 | -0.0466 | .5224 | .1617 | +28 | -47 |
| 17 Capricorni | 6 | 2.72 | 2.3 | 21 57.8 | 14 21.6 | +11 35.6 | +0.4201 | .5173 | .1760 | +54 | -22 |
| 20 Capricorni | 6 | 2.71 | 3.8 | 19 30.8 | 21 11.5 | - 5 47.0 | -1.0610 | .5134 | .1869 | -25 | -90 |
| η Capricorni | 5½ | +2.75 | + 4.0 | -20 20.6 | 23 37.5 | - 3 25.4 | +0.3197 | .5119 | +.1907 | +51 | -27 |
| 30 Capricorni | 6 | 2.75 | 5.4 | 18 30.0 | **19** 6 38.0 | + 3 22.6 | -0.3539 | .5081 | .2008 | +18 | -65 |
| 31 Capricorni | 6½ | 2.74 | 5.6 | 17 58.7 | 6 48.0 | + 3 32.3 | -0.8999 | .5081 | .2012 | -12 | -90 |
| ι Capricorni | 4½ | 2.75 | 6.0 | 17 21.6 | 8 52.9 | + 5 33.5 | -1.1652 | .5069 | .2038 | -30 | -90 |
| γ Capricorni | 3½ | 2.81 | 7.3 | 17 13.2 | 18 15.1 | - 9 20.7 | +0.6473 | .5021 | .2159 | +72 | -10 |
| 45 Capricorni | 6 | 2.78 | 8.1 | 15 19.0 | 20 23.1 | - 7 16.3 | -0.9984 | .5011 | .2184 | -16 | -90 |
| δ Capricorni | 3 | 2.83 | 7.9 | 16 41.2 | 21 57.1 | - 5 44.9 | +0.8634 | .5003 | .2203 | +74 | + 2 |
| μ Capricorni | 5 | +2.80 | + 9.1 | -14 7.9 | **20** 1 20.1 | - 2 27.7 | -1.2137 | .4987 | +.2240 | -31 | -90 |
| ι Aquarii | 4 | 2.87 | 10.0 | 14 28.1 | 8 26.6 | + 4 26.7 | +0.7768 | .4960 | .2314 | +71 | - 3 |
| $e^3$ Aquarii | 5½ | 2.85 | 10.9 | 12 10.3 | 10 45.1 | + 6 41.4 | -1.2238 | .4952 | .2337 | -30 | -90 |
| 42 Aquarii | 6 | 2.90 | 10.7 | 13 26.8 | 14 6.2 | + 9 56.8 | +0.9732 | .4940 | .2367 | +77 | + 8 |
| SATURN | | | | 11 55.2 | 21 14.4 | - 7 6.8 | +1.0007 | .4886 | .2417 | +78 | +10 |
| σ Aquarii | 4½ | 2.92 | 12.4 | 11 18.5 | 21 43.9 | - 6 38.1 | +0.4446 | .4917 | .2433 | +66 | -21 |
| 58 Aquarii | 6 | 2.92 | 12.4 | 11 32.2 | 22 17.9 | - 6 5.1 | +0.8346 | .4916 | .2437 | +79 | 0 |
| 64 Aquarii | 6½ | +2.95 | +13.1 | -10 40.1 | **21** 2 30.4 | - 1 59.5 | +0.9099 | .4905 | +.2469 | +80 | + 3 |
| λ Aquarii | 4 | 2.97 | 14.7 | 8 14.1 | 9 55.6 | + 5 13.5 | +0.0856 | .4892 | .2519 | +47 | -40 |
| 78 Aquarii | 6 | 2.97 | 14.9 | 7 51.5 | 11 1.2 | + 6 17.3 | -0.0515 | .4891 | .2526 | +40 | -47 |
| 81 Aquarii | 6 | 3.00 | 15.4 | 7 43.4 | 14 49.3 | + 9 59.2 | +0.7631 | .4886 | .2547 | +78 | - 5 |
| 82 Aquarii | 6 | 2.99 | 15.6 | 7 14.1 | 15 27.8 | +10 36.6 | +0.3925 | .4886 | .2551 | +65 | -24 |
| B. A. C. 8094 | 6 | 3.02 | 17.3 | 4 9.9 | 22 44.7 | - 6 18.4 | -1.0937 | .4883 | .2587 | -16 | -90 |
| 96 Aquarii | 5½ | 3.07 | 17.0 | 5 47.8 | **22** 0 51.2 | - 4 15.3 | +1.2345 | .4883 | .2596 | +84 | +26 |
| B. A. C. 8134 | 6½ | +3.07 | +17.3 | - 5 20.7 | 1 58.0 | - 3 10.3 | +1.0311 | .4883 | +.2600 | +85 | +11 |
| 11 Piscium | 6½ | 3.07 | 18.6 | 2 28.1 | 6 28.9 | + 1 13.2 | -0.9264 | .4886 | .2617 | - 5 | -90 |
| 14 Piscium | 6 | 3.07 | 19.2 | - 1 55.6 | 9 5.3 | + 3 45.3 | -0.8310 | .4888 | .2625 | + 1 | -90 |
| 21 Piscium | 6 | 3.13 | 20.6 | + 0 23.6 | 17 35.0 | -11 59.0 | -1.1056 | .4900 | .2645 | -16 | -90 |
| B. A. C. 8311 | 6½ | 3.17 | 20.5 | - 0 34.5 | 20 30.9 | - 9 7.8 | +0.7180 | .4909 | .2649 | +87 | - 8 |
| 51 Piscium | 6 | 3.35 | 24.1 | + 6 16.7 | **23** 16 55.4 | +10 42.4 | -1.2374 | .4985 | .2643 | -26 | -84 |
| 60 Piscium | 6 | +3.45 | +24.4 | + 6 4.2 | **24** 0 51.6 | - 5 35.0 | +1.0730 | .5026 | +.2620 | +90 | +15 |

## ELEMENTS FOR FACILITATING THE PREDICTION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON.

### DECEMBER.

| Star's— | | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Mag. | Red'ns from 1876.0. Δα | Δδ | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x' | y' | N'n. | S'n. |
| | | s | " | ° ' | d h m | h m | | | | ° | ° |
| 62 Piscium | 6 | +3.45 | +24.5 | + 6 37.8 | **24** 1 19.1 | - 5 8.3 | +0.5981 | .5031 | +.2618 | +83 | -13 |
| δ Piscium | 4½ | 3.46 | 24.6 | 6 55.0 | 1 31.5 | - 4 56.3 | +0.3471 | .5032 | .2617 | +65 | -25 |
| 101 Piscium | 6 | 3.76 | 27.2 | 14 2.1 | **25** 1 19.1 | - 5 51.6 | -1.0755 | .5216 | .2475 | -15 | -76 |
| 104 Piscium | 6½ | 3.79 | 27.1 | 13 39.9 | 3 0.7 | - 4 13.3 | -0.2700 | .5225 | .2461 | +30 | -54 |
| 26 Arietis | 6 | 4.19 | 27.4 | 19 18.7 | **26** 2 48.4 | - 5 12.8 | -0.5798 | .5467 | .2171 | +13 | -67 |
| B. A. C. 782 | 6½ | 4.22 | 27.1 | 18 20.4 | 4 8.1 | - 3 55.8 | +0.7052 | .5483 | .2149 | +90 | + 1 |
| μ Arietis | 5½ | +4.30 | +27.0 | +19 29.4 | 7 57.5 | - 0 14.4 | +0.3347 | .5525 | +.2086 | +65 | -18 |
| 47 Arietis | 6 | 4.42 | 26.4 | 20 10.6 | 14 40.7 | + 6 14.2 | +0.9892 | .5602 | .1963 | +90 | +21 |
| ε Arietis, *mult.* | 4½ | 4.44 | 26.6 | 20 51.0 | 15 9.4 | + 6 41.8 | +0.3965 | .4608 | .1956 | +69 | -13 |
| 64 Arietis | 6 | 4.69 | 25.8 | 24 17.4 | **27** 1 28.4 | - 7 22.4 | -1.1896 | .5729 | .1736 | -31 | -66 |
| 66 Arietis | 6½ | 4.66 | 25.1 | 22 22.9 | 3 10.6 | - 5 44.1 | +1.0335 | .5749 | .1697 | +90 | +27 |
| 7 Tauri, *mult.* | 6 | 4.76 | 25.0 | 24 3.2 | 5 33.0 | - 3 27.2 | -0.2578 | .5776 | .1639 | +30 | -42 |
| 9 Tauri | 6 | +4.74 | +24.5 | +22 48.3 | 6 34.7 | - 2 28.0 | +1.1663 | .5788 | +.1614 | +90 | +38 |
| 11 Tauri | 6 | 4.84 | 24.8 | 24 56.0 | 8 2.7 | - 1 3.3 | -0.7466 | .5803 | .1577 | + 3 | -64 |
| *g* Pleiadum | 5½ | 4.86 | 24.1 | 23 54.2 | 9 39.0 | + 0 29.1 | +0.5411 | .5822 | .1538 | +81 | -[illegible]1 |
| *b* Pleiadum | 4 | 4.85 | 24.1 | 23 43.7 | 9 40.9 | + 0 30.9 | +0.7229 | .5822 | .1538 | +90 | + 9 |
| *m* Pleiadum | 7 | 4.87 | 24.3 | 24 27.3 | 9 46.8 | + 0 36.7 | +0.0064 | .5823 | .1535 | +45 | -28 |
| *e* Pleiadum | 5 | 4.85 | 24.2 | 24 5.0 | 9 48.3 | + 0 38.1 | +0.3847 | .5823 | .1535 | +69 | - 9 |
| *c* Pleiadum | 5 | +4.86 | +24.0 | +23 59.1 | 10 3.0 | + 0 52.2 | +0.5205 | .5827 | +.1527 | +79 | - 1 |
| *d* Pleiadum | 5 | 4.84 | 23.9 | 23 34.0 | 10 15.2 | + 1 3.9 | +0.9727 | .5828 | .1522 | +90 | +25 |
| η Tauri | 3 | 4.86 | 23.8 | 23 43.6 | 10 42.2 | + 1 29.8 | +0.8798 | .5834 | .1511 | +90 | +19 |
| *f* Pleiadum | 4 | 4.87 | 23.7 | 23 40.7 | 11 21.6 | + 2 7.6 | +1.0259 | .5842 | .1492 | +90 | +29 |
| *h* Pleiadum | 5½ | 4.87 | 23.7 | 23 45.7 | 11 22.1 | + 2 8.1 | +0.9434 | .5842 | .1492 | +90 | +23 |
| B. A. C. 1192 | 6 | 4.91 | 23.9 | 25 12.5 | 11 46.9 | + 2 32.0 | -0.4509 | .5845 | .1481 | +20 | -52 |
| *p* Tauri | 6 | +5.09 | +22.3 | +26 9.7 | 19 38.7 | +10 4.6 | -0.3247 | .5929 | +.1263 | +26 | -42 |
| φ Tauri, *mult.* | 5½ | 5.16 | 21.4 | 27 3.5 | 23 12.6 | -10 30.3 | -0.7878 | .5964 | .1160 | - 1 | -63 |
| $\chi^1$ Tauri | 5 | 5.12 | 20.9 | 25 20.4 | **28** 0 4.6 | - 9 40.5 | +1.0271 | .5973 | .1132 | +90 | +32 |
| $\chi^2$ Tauri | 8½ | 5.12 | 20.9 | 25 20 7 | 0 4.8 | - 9 40.3 | +1.0224 | .5973 | .1132 | +90 | +32 |
| B. A. C. 1648 | 6½ | 5.50 | 14.7 | 27 50.0 | 21 14.0 | +10 34.2 | +0.2195 | .6136 | .0434 | +58 | - 7 |
| β Tauri | 2 | 5.56 | 14.1 | 28 30.3 | 23 5.7 | -11 39.0 | -0.3687 | .6141 | .0368 | +23 | -38 |
| B. A. C. 1709 | 6½ | +5.60 | +13.8 | +29 5.3 | **29** 0 16.7 | -10 31.2 | -0.9045 | .6150 | +0.325 | -10 | -61 |
| B. A. C. 1746 | 6½ | 5.56 | 12.8 | 27 35.0 | 2 31.0 | - 8 22.8 | +0.6442 | .6161 | .0243 | +90 | +17 |
| B. A. C. 1772 | 6 | 5.64 | 12.6 | 29 8.7 | 3 40.3 | - 7 16.6 | -0.8694 | .6165 | .0203 | - 7 | -61 |
| 136 Tauri | 5 | 5.62 | 10.3 | 27 35.0 | 8 37.5 | - 2 32.8 | +0.7246 | .6180 | +.0022 | +90 | +23 |
| B. A. C. 1882 | 6½ | 5.69 | 9.9 | 28 55.4 | 9 43.8 | - 1 29.5 | -0.5928 | .6182 | -.0019 | +11 | -50 |
| B. A. C. 2097 | 6½ | 5.73 | +5.6 | 28 17.5 | 21 33.6 | + 9 48.5 | -0.2499 | .6189 | .0451 | +30 | -31 |
| 49 Aurigæ | 5½ | +5.73 | +4.8 | +28 7.1 | 23 15.3 | +11 25.6 | -0.1608 | .6185 | -.0513 | +35 | -27 |
| 53 Aurigæ | 6 | 5.78 | 4.4 | 29 5.4 | **30** 0 21.0 | -11 31.6 | -1.1703 | .6183 | .0553 | -34 | -61 |
| 54 Aurigæ | 6 | 5 75 | 4.2 | 28 22.3 | 0 46.5 | -11 7.2 | -0.4910 | .6182 | .0567 | +17 | -46 |
| 39 Geminor. | 6½ | 5.68 | 1.1 | 26 14.6 | 7 35.6 | - 4 36.4 | +1.1218 | .6162 | .0811 | +90 | +43 |
| 40 Geminor. | 6½ | 5.66 | + 1.0 | 26 4.8 | 7 49.6 | - 4 23.1 | +1.2607 | .6161 | .0821 | +90 | +55 |
| 47 Geminor. | 6 | 5.69 | - 0.5 | 27 3.5 | 12 1.7 | - 0 22.2 | -0.0712 | .6142 | .0968 | +40 | -26 |
| 53 Geminor. | 6 | +5.75 | - 1.1 | +28 6.6 | 13 38.1 | + 1 10.0 | -1.2595 | .6142 | -.0968 | -46 | -62 |
| A Geminor. | 5½ | 5.61 | 2.2 | 25 17.2 | 16 23.0 | + 3 47.7 | +1.2086 | .6117 | .1114 | +90 | +48 |
| υ Geminorum | 4½ | 5.68 | 3.9 | 27 10.1 | 20 49.4 | + 8 2.3 | -1.1588 | .6089 | .1262 | -30 | -63 |
| B. A. C. 2514 | 6½ | 5.56 | 4.4 | 24 30.0 | 22 3.6 | + 9 13.3 | +1.2924 | .6081 | .1301 | +90 | +59 |
| *c* Geminorum | 6 | 5.62 | 5.0 | 26 4.6 | 23 49.0 | +10 54.2 | -0.4826 | .6068 | .1357 | +18 | -52 |
| κ Geminorum | 3½ | 5.56 | 5.1 | 24 41.5 | 23 57.9 | +11 2.6 | +0.8505 | .6067 | .1360 | +90 | +19 |
| $\omega^1$ Cancri., *mult* | 6 | +5.58 | - 7.4 | +25 43.7 | **31** 5 59.8 | - 7 10.9 | -1.0402 | .6018 | -.1544 | -18 | -65 |
| $\omega^2$ Cancri | 6½ | 5.56 | 7.4 | 25 25.6 | 6 18.1 | - 6 53.3 | -0.7914 | .6016 | .1553 | 0 | -65 |
| λ Cancri | 6 | 5.47 | 10.1 | 24 24.5 | 13 21.6 | - 0 7.7 | -0.9638 | .5953 | .1754 | -11 | -66 |
| γ Cancri | 4½ | +5.28 | -12.6 | +21 54.6 | 22 8.3 | + 8 17.6 | -0.1558 | .5871 | -.1978 | +36 | -40 |

## WASHINGTON MEAN TIME.

### JANUARY.

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 0 | 7 | | II. | Tr. | In. | **11** | 14 | 44 | | I. | Sh. | In. | **22** | 5 | 33 | | I. | Sh. | In. |
| | 0 | 48 | | I. | Tr. | In. | | 15 | 45 | | I. | Tr. | In. | | 6 | 9 | | II. | Sh. | In. |
| | 0 | 53 | | II. | Sh. | Eg. | | 16 | 16 | | II. | Tr. | In.* | | 6 | 41 | | I. | Tr. | In. |
| | 2 | 7 | | I. | Sh. | Eg. | | 16 | 48 | | II. | Sh. | Eg.* | | 7 | 45 | | I. | Sh. | Eg. |
| | 2 | 40 | | II. | Tr. | Eg. | | 16 | 56 | | I. | Sh. | Eg.* | | 8 | 21 | | II. | Tr. | In. |
| | 3 | 0 | | I. | Tr. | Eg. | | 17 | 58 | | I. | Tr. | Eg.* | | 8 | 41 | | II. | Sh. | Eg. |
| | 21 | 9 | 31.9 | I. | Ec. | Dis. | | 18 | 49 | | II. | Tr. | Eg. | | 8 | 53 | | I. | Tr. | Eg. |
| **2** | 0 | 14 | | I. | Oc. | Re. | **12** | 11 | 59 | 58.5 | I. | Ec. | Dis. | | 10 | 54 | | II. | Tr. | Eg. |
| | 15 | 11 | 4.3 | III. | Ec. | Dis. | | 15 | 12 | | I. | Oc. | Re. | **23** | 2 | 50 | 20.7 | I. | Ec. | Dis. |
| | 16 | 51 | 22.3 | III. | Ec. | Re.* | **13** | 8 | 52 | | III. | Sh. | In. | | 6 | 8 | | I. | Oc. | Re. |
| | 17 | 9 | 26.4 | II. | Ec. | Dis.* | | 8 | 58 | 47.2 | II. | Ec. | Dis. | **24** | 0 | 2 | | I. | Sh. | In. |
| | 18 | 23 | | I. | Sh. | In.* | | 9 | 12 | | I. | Sh. | In. | | 0 | 47 | 59.1 | II. | Ec. | Dis. |
| | 18 | 46 | | III. | Oc. | Dis. | | 10 | 15 | | I. | Tr. | In. | | 1 | 10 | | I. | Tr. | In. |
| | 19 | 18 | | I. | Tr. | In. | | 10 | 48 | | III. | Sh. | Eg. | | 2 | 14 | | I. | Sh. | Eg. |
| | 20 | 35 | | I. | Sh. | Eg. | | 11 | 24 | | I. | Sh. | Eg. | | 3 | 4 | 40.5 | III. | Ec. | Dis. |
| | 20 | 42 | | III. | Oc. | Re. | | 12 | 27 | | I. | Tr. | Eg. | | 3 | 22 | | I. | Tr. | Eg. |
| | 21 | 28 | | II. | Oc. | Re. | | 13 | 5 | | III. | Tr. | In. | | 4 | 44 | 34.3 | III. | Ec. | Re. |
| | 21 | 30 | | I. | Tr. | Eg. | | 13 | 31 | | II. | Oc. | Re. | | 5 | 32 | | II. | Oc. | Re. |
| **3** | 15 | 37 | 52.7 | I. | Ec. | Dis. | | 14 | 58 | | III. | Tr. | Eg. | | 7 | 36 | | III. | Oc. | Dis. |
| | 18 | 44 | | I. | Oc. | Re. | **14** | 6 | 28 | 20.0 | I. | Ec. | Dis. | | 9 | 24 | | III. | Oc. | Re. |
| **4** | 11 | 40 | | II. | Sh. | In. | | 9 | 41 | | I. | Oc. | Re. | | 21 | 18 | 39.5 | I. | Ec. | Dis. |
| | 12 | 51 | | I. | Sh. | In. | **15** | 3 | 33 | | II. | Sh. | In. | **25** | 0 | 37 | | I. | Oc. | Re. |
| | 13 | 30 | | II. | Tr. | In. | | 3 | 40 | | I. | Sh. | In. | | 18 | 30 | | I. | Sh. | In. |
| | 13 | 49 | | I. | Tr. | In. | | 4 | 44 | | I. | Tr. | In. | | 19 | 28 | | II. | Sh. | In. |
| | 14 | 12 | | II. | Sh. | Eg. | | 5 | 37 | | II. | Tr. | In. | | 19 | 39 | | I. | Tr. | In. |
| | 15 | 3 | | I. | Sh. | Eg. | | 5 | 52 | | I. | Sh. | Eg. | | 20 | 42 | | I. | Sh. | Eg. |
| | 16 | 0 | | I. | Tr. | Eg. | | 6 | 5 | | II. | Sh. | Eg. | | 21 | 43 | | II. | Tr. | In. |
| | 16 | 3 | | II. | Tr. | Eg. | | 6 | 57 | | I. | Tr. | Eg. | | 21 | 51 | | I. | Tr. | Eg. |
| **5** | 10 | 6 | 21.0 | I. | Ec. | Dis. | | 8 | 10 | | II. | Tr. | Eg. | | 22 | 0 | | II. | Sh. | Eg. |
| | 13 | 13 | | I. | Oc. | Re. | **16** | 0 | 56 | 47.4 | I. | Ec. | Dis. | **26** | 0 | 16 | | II. | Tr. | Eg. |
| **6** | 4 | 54 | | III. | Sh. | In. | | 4 | 10 | | I. | Oc. | Re. | | 15 | 47 | 5.6 | I. | Ec. | Dis.* |
| | 6 | 25 | 54.0 | II. | Ec. | Dis. | | 22 | 8 | | I. | Sh. | In. | | 19 | 6 | | I. | Oc. | Re. |
| | 6 | 51 | | III. | Sh. | Eg. | | 22 | 15 | 11.9 | II. | Ec. | Dis. | **27** | 12 | 58 | | I. | Sh. | In. |
| | 7 | 20 | | I. | Sh. | In. | | 23 | 6 | 53.4 | III. | Ec. | Dis. | | 14 | 4 | 22.3 | II. | Ec. | Dis. |
| | 8 | 17 | | I. | Tr. | In. | | 23 | 14 | | I. | Tr. | In. | | 14 | 8 | | I. | Tr. | In. |
| | 8 | 48 | | III. | Tr. | In. | **17** | 0 | 20 | | I. | Sh. | Eg. | | 15 | 10 | | I. | Sh. | Eg.* |
| | 9 | 32 | | I. | Sh. | Eg. | | 0 | 46 | 53.2 | III. | Ec. | Re. | | 16 | 20 | | I. | Tr. | Eg.* |
| | 10 | 29 | | I. | Tr. | Eg. | | 1 | 26 | | I. | Tr. | Eg. | | 16 | 46 | | III. | Sh. | In.* |
| | 10 | 43 | | III. | Tr. | Eg. | | 2 | 52 | | II. | Oc. | Re. | | 18 | 42 | | III. | Sh. | Eg. |
| | 10 | 49 | | II. | Oc. | Re. | | 3 | 22 | | III. | Oc. | Dis. | | 18 | 52 | | II. | Oc. | Re. |
| **7** | 4 | 34 | 43.4 | I. | Ec. | Dis. | | 5 | 13 | | III. | Oc. | Re. | | 21 | 32 | | III. | Tr. | In. |
| | 7 | 43 | | I. | Oc. | Re. | | 19 | 25 | 6.5 | I. | Ec. | Dis. | | 23 | 19 | | III. | Tr. | Eg. |
| **8** | 0 | 57 | | II. | Sh. | In. | | 22 | 40 | | I. | Oc. | Re. | **28** | 10 | 15 | 26.1 | I. | Ec. | Dis. |
| | 1 | 48 | | I. | Sh. | In. | **18** | 16 | 37 | | I. | Sh. | In.* | | 13 | 35 | | I. | Oc. | Re. |
| | 2 | 46 | | I. | Tr. | In. | | 16 | 52 | | II. | Sh. | In.* | **29** | 7 | 26 | | I. | Sh. | In. |
| | 2 | 53 | | II. | Tr. | In. | | 17 | 43 | | I. | Tr. | In.* | | 8 | 37 | | I. | Tr. | In. |
| | 3 | 29 | | II. | Sh | Eg. | | 18 | 49 | | I. | Sh. | Eg. | | 8 | 45 | | II. | Sh. | In. |
| | 4 | 0 | | I. | Sh. | Eg. | | 19 | 0 | | II. | Tr. | In. | | 9 | 38 | | I. | Sh. | Eg. |
| | 4 | 59 | | I. | Tr. | Eg. | | 19 | 24 | | II. | Sh. | Eg. | | 10 | 49 | | I. | Tr. | Eg. |
| | 5 | 26 | | II. | Tr. | Eg. | | 19 | 55 | | I. | Tr. | Eg. | | 11 | 3 | | II. | Tr. | In. |
| | 23 | 3 | 11.1 | I. | Ec. | Dis. | | 21 | 33 | | II. | Tr. | Eg. | | 11 | 17 | | II. | Sh. | Eg. |
| **9** | 2 | 13 | | I. | Oc. | Re. | **19** | 13 | 53 | 33.2 | I. | Ec. | Dis. | | 13 | 36 | | II. | Tr. | Eg. |
| | 19 | 8 | 42.7 | III. | Ec. | Dis. | | 17 | 9 | | I. | Oc. | Re.* | **30** | 4 | 43 | 52.3 | I. | Ec. | Dis. |
| | 19 | 42 | 21.2 | II. | Ec. | Dis. | **20** | 11 | 5 | | I. | Sh. | In. | | 8 | 4 | | I. | Oc. | Re. |
| | 20 | 16 | | I. | Sh. | In. | | 11 | 31 | 36.0 | II. | Ec. | Dis. | **31** | 1 | 55 | | I. | Sh. | In. |
| | 20 | 48 | 50.5 | III. | Ec. | Re. | | 12 | 12 | | I. | Tr. | In. | | 3 | 6 | | I. | Tr. | In. |
| | 21 | 16 | | I. | Tr. | In. | | 12 | 49 | | III. | Sh. | In. | | 3 | 20 | 44.4 | II. | Ec. | Dis. |
| | 22 | 28 | | I. | Sh. | Eg. | | 13 | 17 | | I. | Sh. | Eg. | | 4 | 7 | | I. | Sh. | Eg |
| | 23 | 5 | | III. | Oc. | Dis. | | 14 | 24 | | I. | Tr. | Eg. | | 5 | 18 | | I. | Tr. | Eg. |
| | 23 | 28 | | I. | Tr. | Eg. | | 14 | 45 | | III. | Sh. | Eg. | | 7 | 2 | 47.5 | III. | Ec. | Dis. |
| **10** | 0 | 10 | | II. | Oc | Re. | | 16 | 12 | | II. | Oc. | Re.* | | 8 | 11 | | II. | Oc. | Re. |
| | 0 | 59 | | III. | Oc. | Re. | | 17 | 20 | | III. | Tr. | In.* | | 8 | 42 | 37.3 | III. | Ec. | Re. |
| | 17 | 31 | 30.9 | I. | Ec. | Dis.* | | 19 | 10 | | III. | Tr. | Eg. | | 11 | 48 | | III. | Oc. | Dis. |
| | 20 | 42 | | I. | Oc. | Re. | **21** | 8 | 21 | 54.2 | I. | Ec. | Dis. | | 13 | 33 | | III. | Oc. | Re. |
| **11** | 14 | 16 | | II. | Sh. | In. | | 11 | 38 | | I. | Oc. | Re. | | 23 | 12 | 10.3 | I. | Ec. | Dis. |

NOTE.—For Phases of Eclipses see pages 462 and 463.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow; In., ingress; Eg., egress; Dis., disappearance; Re., reappearance; * Visible at Washington.

## WASHINGTON MEAN TIME.

### FEBRUARY.

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 2 | 33 | | I. | Oc. | Re. | **10** | 20 | 9 | | I. | Tr. | Eg. | **19** | 21 | 32 | | II. | Tr. | Eg. |
| | 20 | 23 | | I. | Sh. | In. | **11** | 0 | 5 | | II. | Oc. | Re. | **20** | 10 | 24 | 14.4 | I. | Ec. | Dis. |
| | 21 | 35 | | I. | Tr. | In. | | 0 | 41 | | III. | Sh. | In. | | 13 | 48 | | I. | Oc. | Re.* |
| | 22 | 3 | | II. | Sh. | In. | | 2 | 37 | | III. | Sh. | Eg. | **21** | 7 | 32 | | I. | Sh. | In. |
| | 22 | 35 | | I. | Sh. | Eg. | | 5 | 47 | | III. | Tr. | In. | | 8 | 48 | | I. | Tr. | In. |
| | 23 | 47 | | I. | Tr. | Eg. | | 7 | 28 | | III. | Tr. | Eg. | | 9 | 45 | | I. | Sh. | Eg. |
| **2** | 0 | 24 | | II. | Tr. | In. | | 14 | 2 | 23.6 | I. | Ec. | Dis. | | 10 | 59 | 5.0 | II. | Ec. | Dis. |
| | 0 | 36 | | II. | Sh. | Eg. | | 17 | 26 | | I. | Oc. | Re.* | | 11 | 0 | | I. | Tr. | Eg. |
| | 2 | 57 | | II. | Tr. | Eg. | **12** | 11 | 12 | | I. | Sh. | In. | | 15 | 57 | | II. | Oc. | Re.* |
| | 17 | 40 | 35.7 | I. | Ec. | Dis.* | | 12 | 26 | | I. | Tr. | In. | | 18 | 54 | 47.4 | III. | Ec. | Dis. |
| | 21 | 2 | | I. | Oc. | Re. | | 13 | 24 | | I. | Sh. | Eg. | | 20 | 34 | 37.8 | III. | Ec. | Re. |
| **3** | 14 | 51 | | I. | Sh. | In.* | | 13 | 56 | | II. | Sh. | In. | | 23 | 59 | | III. | Oc. | Dis. |
| | 16 | 3 | | I. | Tr. | In.* | | 14 | 38 | | I. | Tr. | Eg.* | **22** | 1 | 36 | | III. | Oc. | Re. |
| | 16 | 37 | 7.7 | II. | Ec. | Dis.* | | 16 | 23 | | II. | Tr. | In.* | | 4 | 52 | 32.9 | I. | Ec. | Dis. |
| | 17 | 3 | | I. | Sh. | Eg.* | | 16 | 29 | | II. | Sh. | Eg.* | | 8 | 17 | | I. | Oc. | Re. |
| | 18 | 15 | | I. | Tr. | Eg. | | 18 | 55 | | II. | Tr. | Eg. | **23** | 2 | 0 | | I. | Sh. | In. |
| | 20 | 43 | | III. | Sh. | In. | **13** | 8 | 30 | 49.1 | I. | Ec. | Dis. | | 3 | 16 | | I. | Tr. | In. |
| | 21 | 29 | | II. | Oc. | Re. | | 11 | 55 | | I. | Oc. | Re. | | 4 | 13 | | I. | Sh. | Eg. |
| | 22 | 39 | | III. | Sh. | Eg. | **14** | 5 | 40 | | I. | Sh. | In. | | 5 | 28 | | I. | Tr. | Eg. |
| **4** | 1 | 41 | | III. | Tr. | In. | | 6 | 54 | | I. | Tr. | In. | | 5 | 50 | | II. | Sh. | In. |
| | 3 | 25 | | III. | Tr. | Eg. | | 7 | 52 | | I. | Sh. | Eg. | | 8 | 18 | | II. | Tr. | In. |
| | 12 | 8 | 55.6 | I. | Ec. | Dis. | | 8 | 26 | 16.0 | II. | Ec. | Dis. | | 8 | 23 | | II. | Sh. | Eg. |
| | 15 | 31 | | I. | Oc. | Re.* | | 9 | 6 | | I. | Tr. | Eg. | | 10 | 50 | | II. | Tr. | Eg. |
| **5** | 9 | 20 | | I. | Sh. | In. | | 13 | 23 | | II. | Oc. | Re. | | 23 | 20 | 56.9 | I. | Ec. | Dis. |
| | 10 | 32 | | I. | Tr. | In. | | 14 | 57 | 32.4 | III. | Ec. | Dis.* | **24** | 2 | 45 | | I. | Oc. | Re. |
| | 11 | 21 | | II. | Sh. | In. | | 16 | 37 | 20.6 | III. | Ec. | Re.* | | 20 | 29 | | I. | Sh. | In. |
| | 11 | 31 | | I. | Sh. | Eg. | | 19 | 59 | | III. | Oc. | Dis. | | 21 | 44 | | I. | Tr. | In. |
| | 12 | 44 | | I. | Tr. | Eg. | | 21 | 39 | | III. | Oc. | Re. | | 22 | 42 | | I. | Sh. | Eg. |
| | 13 | 44 | | II. | Tr. | In. | **15** | 2 | 59 | 6.6 | I. | Ec. | Dis. | | 23 | 56 | | I. | Tr. | Eg. |
| | 13 | 53 | | II. | Sh. | Eg. | | 6 | 24 | | I. | Oc. | Re. | **25** | 0 | 15 | 32.0 | II. | Ec. | Dis. |
| | 16 | 16 | | II. | Tr. | Eg.* | **16** | 0 | 8 | | I. | Sh. | In. | | 5 | 13 | | II. | Oc. | Re. |
| **6** | 6 | 37 | 19.3 | I. | Ec. | Dis. | | 1 | 23 | | I. | Tr. | In. | | 8 | 35 | | III. | Sh. | In. |
| | 10 | 0 | | I. | Oc. | Re. | | 2 | 20 | | I. | Sh. | Eg. | | 10 | 31 | | III. | Sh. | Eg. |
| **7** | 3 | 48 | | I. | Sh. | In. | | 3 | 15 | | II. | Sh. | In. | | 13 | 46 | | III. | Tr. | In.* |
| | 5 | 0 | | I. | Tr. | In. | | 3 | 35 | | I. | Tr. | Eg. | | 15 | 23 | | III. | Tr. | Eg.* |
| | 5 | 53 | 29.6 | II. | Ec. | Dis. | | 5 | 42 | | II. | Tr. | In. | | 17 | 49 | 16.1 | I. | Ec. | Dis. |
| | 6 | 0 | | I. | Sh. | Eg. | | 5 | 47 | | II. | Sh. | Eg. | | 21 | 14 | | I. | Oc. | Re. |
| | 7 | 12 | | I. | Tr. | Eg. | | 8 | 14 | | II. | Tr. | Eg. | **26** | 14 | 57 | | I. | Sh. | In.* |
| | 10 | 47 | | II. | Oc. | Re. | | 21 | 27 | 31.2 | I. | Ec. | Dis. | | 16 | 12 | | I. | Tr. | In.* |
| | 11 | 0 | 14.9 | III. | Ec. | Dis. | **17** | 0 | 52 | | I. | Oc. | Re. | | 17 | 10 | | I. | Sh. | Eg.* |
| | 12 | 40 | 2.9 | III. | Ec. | Re. | | 18 | 36 | | I. | Sh. | In. | | 18 | 24 | | I. | Tr. | Eg. |
| | 15 | 55 | | III. | Oc. | Dis.* | | 19 | 51 | | I. | Tr. | In. | | 19 | 8 | | II. | Sh. | In. |
| | 17 | 38 | | III. | Oc. | Re.* | | 20 | 48 | | I. | Sh. | Eg. | | 21 | 35 | | II. | Tr. | In. |
| **8** | 1 | 5 | 39.1 | I. | Ec. | Dis. | | 21 | 42 | 41.0 | II. | Ec. | Dis. | | 21 | 40 | | II. | Sh. | Eg. |
| | 4 | 29 | | I. | Oc. | Re. | | 22 | 4 | | I. | Tr. | Eg. | **27** | 0 | 7 | | II. | Tr. | Eg. |
| | 22 | 16 | | I. | Sh. | In. | **18** | 2 | 40 | | II. | Oc. | Re. | | 12 | 17 | 41.1 | I. | Ec. | Dis. |
| | 23 | 29 | | I. | Tr. | In. | | 4 | 38 | | III. | Sh. | In. | | 15 | 42 | | I. | Oc. | Re.* |
| **9** | 0 | 28 | | I. | Sh. | Eg. | | 6 | 34 | | III. | Sh. | Eg. | **28** | 9 | 26 | | I. | Sh | In. |
| | 0 | 39 | | II. | Sh. | In. | | 9 | 48 | | III. | Tr. | In. | | 10 | 40 | | I. | Tr. | In. |
| | 1 | 40 | | I. | Tr. | Eg. | | 11 | 27 | | III. | Tr. | Eg. | | 11 | 38 | | I. | Sh. | Eg. |
| | 3 | 4 | | II. | Tr. | In. | | 15 | 55 | 50.4 | I. | Ec. | Dis.* | | 12 | 52 | | I. | Tr. | Eg. |
| | 3 | 11 | | II. | Sh. | Eg. | | 19 | 20 | | I. | Oc. | Re. | | 13 | 31 | 59.0 | II. | Ec. | Dis.* |
| | 5 | 36 | | II. | Tr. | Eg. | **19** | 13 | 4 | | I. | Sh. | In. | | 18 | 28 | | II. | Oc. | Re. |
| | 19 | 34 | 4.1 | I. | Ec. | Dis. | | 14 | 20 | | I. | Tr. | In.* | | 22 | 52 | 9.0 | III. | Ec. | Dis. |
| | 22 | 58 | | I. | Oc. | Re. | | 15 | 17 | | I. | Sh. | Eg.* | **29** | 0 | 32 | 3.8 | III. | Ec. | Re. |
| **10** | 16 | 44 | | I. | Sh | In.* | | 16 | 32 | | I. | Tr. | Eg.* | | 3 | 54 | | III. | Oc. | Dis. |
| | 17 | 57 | | I. | Tr. | In. | | 16 | 34 | | II. | Sh. | In.* | | 5 | 29 | | III. | Oc. | Re. |
| | 18 | 56 | | I. | Sh. | Eg. | | 19 | 1 | | II. | Tr. | In. | | 6 | 45 | 58.5 | I. | Ec. | Dis. |
| | 19 | 9 | 53.5 | II. | Ec. | Dis. | | 19 | 6 | | II. | Sh. | Eg. | | 10 | 10 | | I. | Oc. | Re. |

### MARCH.

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 3 | 54 | | I. | Sh. | In. | **1** | 8 | 26 | | II. | Sh. | In. | **2** | 1 | 14 | 22.8 | I. | Ec. | Dis. |
| | 5 | 8 | | I. | Tr. | In. | | 10 | 52 | | II. | Tr. | In. | | 4 | 38 | | I. | Oc. | Re. |
| | 6 | 6 | | I. | Sh. | Eg. | | 10 | 58 | | II. | Sh. | Eg. | | 22 | 22 | | I. | Sh. | In. |
| | 7 | 20 | | I. | Tr. | Eg. | | 13 | 24 | | II. | Tr. | Eg.* | | 23 | 36 | | I. | Tr. | In. |

NOTE.—For Phases of Eclipses see pages 462 and 463. * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow:

## WASHINGTON MEAN TIME.

**MARCH.**

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 0 | 34 | | I. | Sh. | Eg. | 12 | 2 | 51 | | II. | Sh. | Eg. | 22 | 9 | 33 | | I. | Sh | In. |
| | 1 | 48 | | I. | Tr. | Eg. | | 5 | 10 | | II. | Tr. | Eg. | | 10 | 38 | | I. | Tr. | In. |
| | 2 | 48 | 28.1 | II. | Ec. | Dis. | | 16 | 4 | 33.9 | I. | Ec. | Dis.* | | 11 | 46 | | I. | Sh. | Eg. |
| | 7 | 43 | | II. | Oc. | Re. | | 19 | 25 | | I. | Oc. | Re. | | 12 | 49 | | I. | Tr. | Eg.* |
| | 12 | 33 | | III. | Sh. | In. | 13 | 13 | 12 | | I. | Sh. | In.* | | 16 | 11 | | II. | Sh. | In.* |
| | 14 | 29 | | III. | Sh. | Eg.* | | 14 | 22 | | I. | Tr. | In.* | | 18 | 20 | | II. | Tr. | In. |
| | 17 | 40 | | III. | Tr. | In. | | 15 | 24 | | I. | Sh. | Eg.* | | 18 | 45 | | II. | Sh. | Eg. |
| | 19 | 13 | | III. | Tr. | Eg. | | 16 | 33 | | I. | Tr. | Eg.* | | 20 | 52 | | II. | Tr. | Eg. |
| | 19 | 42 | 42.1 | I. | Ec. | Dis. | | 18 | 38 | 4.8 | II. | Ec. | Dis. | 23 | 6 | 54 | 44.4 | I. | Ec. | Dis. |
| | 23 | 6 | | I. | Oc. | Re. | | 23 | 26 | | II. | Oc. | Re. | | 10 | 8 | | I. | Oc. | Re. |
| 4 | 16 | 50 | | I. | Sh. | In.* | 14 | 6 | 47 | 44.0 | III. | Ec. | Dis. | 24 | 4 | 1 | | I. | Sh. | In. |
| | 18 | 4 | | I. | Tr. | In. | | 8 | 27 | 53.4 | III. | Ec. | Re. | | 5 | 5 | | I. | Tr. | In. |
| | 19 | 3 | | I. | Sh. | Eg. | | 10 | 32 | 51.9 | I. | Ec. | Dis. | | 6 | 14 | | I. | Sh. | Eg. |
| | 20 | 16 | | I. | Tr. | Eg. | | 11 | 33 | | III. | Oc. | Dis. | | 7 | 16 | | I. | Tr. | Eg. |
| | 21 | 43 | | II. | Sh. | In. | | 13 | 3 | | III. | Oc. | Re.* | | 10 | 27 | 59.4 | II. | Ec. | Dis. |
| 5 | 0 | 8 | | II. | Tr. | In. | | 13 | 52 | | I. | Oc. | Re.* | | 15 | 3 | | II. | Oc. | Re.* |
| | 0 | 16 | | II. | Sh. | Eg. | 15 | 7 | 40 | | I. | Sh. | In. | 25 | 0 | 24 | | III. | Sh. | In. |
| | 2 | 39 | | II. | Tr. | Eg. | | 8 | 50 | | I. | Tr. | In. | | 1 | 23 | 4.8 | I. | Ec. | Dis. |
| | 14 | 11 | 7.4 | I. | Ec. | Dis.* | | 9 | 53 | | I. | Sh. | Eg. | | 2 | 20 | | III. | Sh. | Eg. |
| | 17 | 34 | | I. | Oc. | Re. | | 11 | 0 | | I. | Tr. | Eg. | | 4 | 35 | | I. | Oc. | Re. |
| 6 | 11 | 19 | | I. | Sh. | In. | | 13 | 36 | | II. | Sh. | In.* | | 4 | 52 | | III. | Tr. | In. |
| | 12 | 32 | | I. | Tr. | In. | | 15 | 53 | | II. | Tr. | In.* | | 6 | 19 | | III. | Tr. | Eg. |
| | 13 | 31 | | I. | Sh. | Eg.* | | 16 | 9 | | II. | Sh. | Eg.* | | 22 | 30 | | I. | Sh. | In. |
| | 14 | 43 | | I. | Tr. | Eg.* | | 18 | 25 | | II. | Tr. | Eg. | | 23 | 32 | | I. | Tr. | In. |
| | 16 | 4 | 58.4 | II. | Ec. | Dis.* | 16 | 5 | 1 | 16.0 | I. | Ec. | Dis. | 26 | 0 | 42 | | I. | Sh. | Eg. |
| | 20 | 58 | | II. | Oc. | Re. | | 8 | 19 | | I. | Oc. | Re. | | 1 | 43 | | I. | Tr. | Eg. |
| 7 | 2 | 50 | 6.0 | III. | Ec. | Dis. | 17 | 2 | 8 | | I. | Sh. | In. | | 5 | 29 | | II. | Sh. | In. |
| | 4 | 30 | 7.0 | III. | Ec. | Re. | | 3 | 17 | | I. | Tr. | In. | | 7 | 33 | | II. | Tr. | In. |
| | 7 | 46 | | III. | Oc. | Dis. | | 4 | 21 | | I. | Sh. | Eg. | | 8 | 2 | | II. | Sh. | Eg. |
| | 8 | 39 | 25.0 | I. | Ec. | Dis. | | 5 | 28 | | I. | Tr. | Eg. | | 10 | 4 | | II. | Tr. | Eg. |
| | 9 | 19 | | III. | Oc. | Re. | | 7 | 54 | 40.1 | II. | Ec. | Dis. | | 19 | 51 | 31.0 | I. | Ec. | Dis. |
| | 12 | 1 | | I. | Oc. | Re. | | 12 | 39 | | II. | Oc. | Re.* | | 23 | 2 | | I. | Oc. | Re. |
| 8 | 5 | 47 | | I. | Sh. | In. | | 20 | 27 | | III. | Sh. | In. | 27 | 16 | 58 | | I. | Sh. | In.* |
| | 7 | 0 | | I. | Tr. | In. | | 22 | 23 | | III. | Sh. | Eg. | | 17 | 59 | | I. | Tr. | In. |
| | 8 | 0 | | I. | Sh. | Eg. | | 23 | 29 | 35.6 | I. | Ec. | Dis | | 19 | 10 | | I. | Sh. | Eg. |
| | 9 | 11 | | I. | Tr. | Eg. | 18 | 1 | 12 | | III. | Tr. | In. | | 20 | 10 | | I. | Tr. | Eg. |
| | 11 | 1 | | II. | Sh. | In. | | 2 | 42 | | III. | Tr. | Eg. | | 23 | 44 | 46.9 | II. | Ec. | Dis. |
| | 13 | 24 | | II. | Tr. | In.* | | 2 | 46 | | I. | Oc. | Re. | 28 | 4 | 15 | | II. | Oc. | Re. |
| | 13 | 34 | | II. | Sh. | Eg.* | | 20 | 36 | | I. | Sh. | In. | | 14 | 19 | 50.2 | I. | Ec. | Dis.* |
| | 15 | 55 | | II. | Tr. | Eg.* | | 21 | 44 | | I. | Tr. | In. | | 14 | 43 | 9.2 | III. | Ec. | Dis.* |
| 9 | 3 | 7 | 49.2 | I. | Ec. | Dis. | | 22 | 50 | | I. | Sh. | Eg. | | 16 | 23 | 41.4 | III. | Eo. | Re.* |
| | 6 | 29 | | I. | Oc. | Re. | | 23 | 55 | | I. | Tr. | Eg. | | 17 | 29 | | I. | Oc. | Re. |
| 10 | 0 | 15 | | I. | Sh. | In. | 19 | 2 | 54 | | II. | Sh. | In. | | 18 | 53 | | III. | Oc. | Dis. |
| | 1 | 27 | | I. | Tr. | In. | | 5 | 7 | | II. | Tr. | In. | | 20 | 20 | | III. | Oc. | Re. |
| | 2 | 28 | | I. | Sh. | Eg. | | 5 | 27 | | II. | Sh. | Eg. | 29 | 11 | 27 | | I. | Sh. | In.* |
| | 3 | 38 | | I. | Tr. | Eg. | | 7 | 38 | | II. | Tr. | Eg. | | 12 | 26 | | I. | Tr. | In.* |
| | 5 | 21 | 30.3 | II. | Ec. | Dis. | | 17 | 58 | 1.2 | I. | Ec. | Dis. | | 13 | 38 | | I. | Sh. | Eg.* |
| | 10 | 12 | | II. | Oc. | Re. | | 21 | 14 | | I. | Oc. | Re. | | 14 | 37 | | I. | Tr. | Eg.* |
| | 16 | 30 | | III. | Sh. | In.* | 20 | 15 | 5 | | I. | Sh. | In.* | | 18 | 47 | | II. | Sh. | In. |
| | 18 | 26 | | III. | Sh. | Eg. | | 16 | 11 | | I. | Tr. | In.* | | 20 | 45 | | II. | Tr. | In. |
| | 21 | 28 | | III. | Tr. | In. | | 17 | 18 | | I. | Sh. | Eg. | | 21 | 20 | | II. | Sh. | Eg. |
| | 21 | 36 | 8.7 | I. | Ec. | Dis. | | 18 | 22 | | I. | Tr. | Eg. | | 23 | 16 | | II. | Tr. | Eg. |
| | 23 | 0 | | III. | Tr. | Eg. | | 21 | 11 | 20.2 | II. | Ec. | Dis. | 30 | 8 | 48 | 15.4 | I. | Ec. | Dis. |
| 11 | 0 | 57 | | I. | Oc. | Re. | 21 | 1 | 51 | | II. | Oc. | Re. | | 11 | 56 | | I. | Oc. | Re.* |
| | 18 | 43 | | I. | Sh. | In. | | 10 | 45 | 43.7 | III. | Ec. | Dis. | 31 | 5 | 55 | | I. | Sh. | In. |
| | 19 | 55 | | I. | Tr. | In. | | 12 | 26 | 3.5 | III. | Ec. | Re.* | | 6 | 53 | | I. | Tr. | In. |
| | 20 | 56 | | I. | Sh. | Eg. | | 12 | 26 | 19.6 | I. | Ec. | Dis.* | | 8 | 7 | | I. | Sh. | Eg. |
| | 22 | 6 | | I. | Tr. | Eg. | | 15 | 15 | | III. | Oc. | Dis.* | | 9 | 4 | | I. | Tr. | Eg. |
| 12 | 0 | 18 | | II. | Sh. | In. | | 15 | 41 | | I. | Oc. | Re.* | | 13 | 1 | 31.2 | II. | Ec. | Dis.* |
| | 2 | 38 | | II. | Tr. | In. | | 16 | 44 | | III. | Oc. | Re.* | | 17 | 26 | | II. | Oc. | Re. |

**APRIL.**

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 16 | 36.5 | I. | Ec. | Dis. | 1 | 6 | 23 | | I. | Ec. | Re. | 2 | 0 | 23 | | I. | Sh. | In. |
| | 4 | 22 | | III. | Sh. | In. | | 8 | 27 | | III. | Tr. | In. | | 1 | 20 | | I. | Tr. | In. |
| | 6 | 18 | | III. | Sh. | Eg. | | 9 | 53 | | III. | Tr. | Eg. | | 2 | 35 | | I. | Sh. | Eg. |

In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; * Visible at Washington.

## WASHINGTON MEAN TIME.

### APRIL.

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2** | 3 | 31 | | I. | Tr. | Eg. | **12** | 1 | 53 | | III. | Oc. | Dis. | **21** | 20 | 43 | 19.0 | II. | Ec. | Dis. |
| | 8 | 4 | | II. | Sh. | In. | | 3 | 19 | | III. | Oc. | Re. | **22** | 0 | 23 | | II. | Oc. | Re. |
| | 9 | 57 | | II. | Tr. | In. | | 15 | 13 | | I. | Sh. | In.* | | 8 | 57 | 32.2 | I. | Ec. | Dis. |
| | 10 | 37 | | II. | Sh. | Eg.* | | 16 | 0 | | I. | Tr. | In.* | | 11 | 41 | | I. | Oc. | Re.* |
| | 12 | 27 | | II. | Tr. | Eg.* | | 17 | 25 | | I. | Sh. | Eg. | | 16 | 16 | | III. | Sh. | In.* |
| | 21 | 45 | 3.3 | I. | Ec. | Dis. | | 18 | 10 | | I. | Tr. | Eg. | | 18 | 13 | | III. | Sh. | Eg |
| **3** | 0 | 50 | | I. | Oc. | Re. | | 23 | 57 | | II. | Sh. | In. | | 18 | 47 | | III. | Tr. | In. |
| | 18 | 51 | | I. | Sh. | In. | **13** | 1 | 28 | | II. | Tr. | In. | | 20 | 13 | | III. | Tr. | Eg. |
| | 19 | 47 | | I. | Tr. | In. | | 2 | 30 | | II. | Sh. | Eg. | **23** | 6 | 3 | | I. | Sh. | In. |
| | 21 | 4 | | I. | Sh. | Eg. | | 3 | 59 | | II. | Tr. | Eg. | | 6 | 37 | | I. | Tr. | In. |
| | 21 | 58 | | I. | Tr. | Eg. | | 12 | 35 | 25.9 | I. | Ec. | Dis.* | | 8 | 15 | | I. | Sh. | Eg. |
| **4** | 2 | 18 | 24.7 | II. | Ec. | Dis. | | 15 | 30 | | I. | Oc. | Re.* | | 8 | 48 | | I. | Tr. | Eg. |
| | 6 | 37 | | II. | Oc. | Re. | **14** | 9 | 41 | | I. | Sh. | In. | | 15 | 49 | | II. | Sh. | In.* |
| | 16 | 13 | 23.3 | I. | Ec. | Dis.* | | 10 | 26 | | I. | Tr. | In.* | | 16 | 55 | | II. | Tr. | In. |
| | 18 | 40 | 29.7 | III. | Ec. | Dis. | | 11 | 53 | | I. | Sh. | Eg.* | | 18 | 23 | | II. | Sh. | Eg. |
| | 19 | 17 | | I. | Oc. | Re. | | 12 | 37 | | I. | Tr. | Eg.* | | 19 | 26 | | II. | Tr. | Eg. |
| | 20 | 21 | 16.3 | III. | Ec. | Re. | | 18 | 9 | 8.0 | II. | Ec. | Dis. | **24** | 3 | 26 | 1.3 | I. | Ec. | Dis. |
| | 22 | 25 | | III. | Oc. | Dis. | | 22 | 6 | | II. | Oc. | Re. | | 6 | 7 | | I. | Oc. | Re. |
| | 23 | 51 | | III. | Oo. | Re. | **15** | 7 | 3 | 48.9 | I. | Ec. | Dis. | **25** | 0 | 32 | | I. | Sh. | In. |
| **5** | 13 | 20 | | I. | Sh. | In.* | | 9 | 56 | | I. | Oc. | Re. | | 1 | 3 | | I. | Tr. | In. |
| | 14 | 14 | | I. | Tr. | In.* | | 12 | 18 | | III. | Sh. | In.* | | 2 | 44 | | I. | Sh. | Eg. |
| | 15 | 32 | | I. | Sh. | Eg.* | | 14 | 15 | | III. | Sh. | Eg.* | | 3 | 14 | | I. | Tr. | Eg. |
| | 16 | 25 | | I. | Tr. | Eg.* | | 15 | 24 | | III. | Tr. | In.* | | 10 | 0 | 39.2 | II. | Ec. | Dis.* |
| | 21 | 22 | | II. | Sh. | In. | | 16 | 50 | | III. | Tr. | Eg. | | 13 | 31 | | II. | Oc. | Re.* |
| | 23 | 8 | | II. | Tr. | In. | **16** | 4 | 10 | | I. | Sh. | In. | | 21 | 54 | 25.0 | I. | Ec. | Dis. |
| | 23 | 55 | | II. | Sh. | Eg. | | 4 | 52 | | I. | Sh. | Eg. | **26** | 0 | 33 | | I. | Oc. | Re. |
| **6** | 1 | 39 | | II. | Tr. | Eg. | | 6 | 21 | | I. | Tr. | In. | | 6 | 33 | 51.0 | III. | Ec. | Dis. |
| | 10 | 41 | 49.0 | I. | Ec. | Dis.* | | 7 | 3 | | I. | Tr. | Eg. | | 8 | 15 | 33.0 | III. | Ec. | Re. |
| | 13 | 44 | | I. | Oc. | Re.* | | 13 | 14 | | II. | Sh. | In.* | | 8 | 39 | | III. | Oc. | Dis |
| **7** | 7 | 48 | | I. | Sh. | In. | | 14 | 38 | | II. | Tr. | In.* | | 10 | 6 | | III. | Oc. | Re.* |
| | 8 | 40 | | I. | Tr. | In. | | 15 | 48 | | II. | Sh. | Eg.* | | 19 | 0 | | I. | Sh. | In. |
| | 10 | 0 | | I. | Sh. | Eg. | | 17 | 8 | | II. | Tr. | Eg. | | 19 | 29 | | I. | Tr. | In. |
| | 10 | 51 | | I. | Tr. | Eg.* | **17** | 1 | 32 | 17.6 | I. | Ec. | Dis. | | 21 | 12 | | I. | Sh. | Eg |
| | 15 | 35 | 12.8 | II. | Ec. | Dis.* | | 4 | 22 | | I. | Oc. | Re. | | 21 | 40 | | I. | Tr. | Eg |
| | 19 | 47 | | II. | Oc. | Re. | | 22 | 38 | | I. | Sh. | In. | **27** | 5 | 6 | | II. | Sh. | In. |
| **8** | 5 | 10 | 10.7 | I. | Ec. | Dis. | | 23 | 18 | | I. | Tr. | In. | | 6 | 4 | | II. | Sh. | Eg. |
| | 8 | 10 | | I. | Oc. | Re. | **18** | 0 | 50 | | I. | Sh. | Eg. | | 7 | 40 | | II. | Tr. | In. |
| | 8 | 20 | | III. | Sh. | In. | | 1 | 29 | | I. | Tr. | Eg. | | 8 | 34 | | II. | Tr. | Eg. |
| | 10 | 16 | | III. | Sh. | Eg. | | 7 | 26 | 18.8 | II. | Ec. | Dis. | | 16 | 22 | 53.3 | I. | Ec. | Dis.* |
| | 11 | 57 | | III. | Tr. | In.* | | 11 | 15 | | II. | Oc. | Re.* | | 18 | 59 | | I. | Oc. | Eg. |
| | 13 | 23 | | III. | Tr. | Eg.* | | 20 | 0 | 40.1 | I. | Ec. | Dis. | **28** | 13 | 29 | | I. | Sh. | In.* |
| **9** | 2 | 17 | | I. | Sh. | In. | | 22 | 49 | | I. | Oc. | Re. | | 13 | 55 | | I. | Tr. | In.* |
| | 3 | 7 | | I. | Tr. | In. | **19** | 2 | 35 | 32.0 | III. | Ec. | Dis. | | 15 | 41 | | I. | Sh. | Eg.* |
| | 4 | 28 | | I. | Sh. | Eg. | | 4 | 16 | 53.6 | III. | Ec. | Re. | | 16 | 6 | | I. | Tr. | Eg.* |
| | 5 | 18 | | I. | Tr. | Eg. | | 5 | 17 | | III. | Oc. | Dis. | | 23 | 17 | 44.8 | II. | Ec. | Dis. |
| | 10 | 39 | | II. | Sh. | In.* | | 6 | 44 | | III. | Oc. | Re. | **29** | 2 | 39 | | II. | Oc. | Re. |
| | 12 | 18 | | II. | Tr. | In.* | | 17 | 6 | | I. | Sh. | In. | | 10 | 51 | 18.6 | I. | Ec. | Dis.* |
| | 13 | 13 | | II. | Sh. | Eg.* | | 17 | 44 | | I. | Tr. | In. | | 13 | 25 | | I. | Oc. | Re.* |
| | 14 | 49 | | II. | Tr. | Eg.* | | 19 | 18 | | I. | Sh. | Eg. | | 20 | 13 | | III. | Sh. | In. |
| | 23 | 38 | 38.2 | I. | Ec. | Dis. | | 19 | 56 | | I. | Tr. | Eg. | | 22 | 6 | | III. | Tr. | In. |
| **10** | 2 | 37 | | I. | Oc. | Re. | **20** | 2 | 31 | | II. | Sh. | In. | | 22 | 11 | | III. | Sh. | Eg. |
| | 20 | 45 | | I. | Sh. | In. | | 3 | 47 | | II. | Tr. | In. | | 23 | 33 | | III. | Tr. | Eg. |
| | 21 | 34 | | I. | Tr. | In. | | 5 | 5 | | II. | Sh. | Eg. | **30** | 7 | 57 | | I. | Sh. | In. |
| | 22 | 56 | | I. | Sh. | Eg. | | 6 | 18 | | II. | Tr. | Eg. | | 8 | 21 | | I. | Tr. | In. |
| | 23 | 44 | | I. | Tr. | Eg. | | 14 | 29 | 7.7 | I. | Ec. | Dis.* | | 10 | 10 | | I. | Sh. | Eg.* |
| **11** | 4 | 52 | 14.3 | II. | Ec. | Dis. | | 17 | 15 | | I. | Oc. | Re. | | 10 | 32 | | I. | Tr. | Eg.* |
| | 8 | 56 | | II. | Oc. | Re. | **21** | 11 | 35 | | I. | Sh. | In.* | | 18 | 23 | | II. | Sh. | In. |
| | 18 | 6 | 59.4 | I. | Ec. | Dis. | | 12 | 10 | | I. | Tr. | In.* | | 19 | 11 | | II. | Tr. | In. |
| | 21 | 3 | | I. | Oc. | Re. | | 13 | 47 | | I. | Sh. | Eg.* | | 20 | 58 | | II. | Sh. | Eg. |
| | 22 | 37 | 54.8 | III. | Ec. | Dis. | | 14 | 22 | | I. | Tr. | Eg.* | | 21 | 42 | | II. | Tr. | Eg. |
| **12** | 0 | 18 | 58.0 | III. | Ec. | Re. | | | | | | | | | | | | | | |

### MAY.

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 5 | 19 | 49.3 | I. | Ec. | Dis. | **2** | 2 | 25 | | I. | Sh. | In. | **2** | 4 | 38 | | I. | Sh. | Eg. |
| | 7 | 52 | | I. | Oc. | Re. | | 2 | 47 | | I. | Tr. | In. | | 4 | 58 | | I. | Tr. | Eg. |

NOTE.—For Phases of Eclipses see pages 462 and 463. * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow;

## WASHINGTON MEAN TIME.

**MAY.**

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 12 | 35 | 14.6 | II. | Ec. | Dis.* | 12 | 17 | 16 | | I. | Sh. | In. | 21 | 15 | 51 | | I. | Sh. | Eg. |
| | 15 | 47 | | II. | Oc. | Re.* | | 17 | 23 | | I. | Tr. | In. | 22 | 1 | 55 | | II. | Tr. | In. |
| | 23 | 48 | 14.8 | I. | Ec. | Dis. | | 19 | 29 | | I. | Sh. | Eg. | | 2 | 8 | | II. | Sh. | In. |
| 3 | 2 | 18 | | I. | Oc. | Re. | | 19 | 34 | | I. | Tr. | Eg. | | 4 | 26 | | II. | Tr. | Eg. |
| | 10 | 31 | 52.4 | III. | Ec. | Dis.* | 13 | 4 | 27 | 21.2 | II. | Ec. | Dis. | | 4 | 43 | | II. | Sh. | Eg. |
| | 13 | 25 | | III. | Oc. | Re.* | | 7 | 9 | | II. | Oc. | Re. | | 10 | 52 | | I. | Oc. | Dis.* |
| | 20 | 54 | | I. | Sh. | In. | | 14 | 39 | 9.3 | I. | Ec. | Dis.* | | 13 | 9 | 29.7 | I. | Ec. | Re.* |
| | 21 | 13 | | I. | Tr. | In. | | 16 | 54 | | I. | Oc. | Re. | 23 | 7 | 59 | | I. | Tr. | In. |
| | 23 | 6 | | I. | Sh. | Eg. | 14 | 4 | 9 | | III. | Sh. | In. | | 8 | 8 | | I. | Sh. | In. |
| | 23 | 24 | | I. | Tr. | Eg. | | 4 | 38 | | III. | Tr. | In. | | 10 | 10 | | I. | Tr. | Eg.* |
| 4 | 7 | 41 | | II. | Sh. | In. | | 6 | 7 | | III. | Sh. | Eg. | | 10 | 20 | | I. | Sh. | Eg.* |
| | 8 | 17 | | II. | Tr. | In. | | 6 | 11 | | III. | Tr. | Eg. | | 20 | 1 | | II. | Oc. | Dis. |
| | 10 | 15 | | II. | Sh | Eg.* | | 11 | 45 | | I. | Sh. | In.* | | 22 | 51 | 34.5 | II. | Ec. | Re. |
| | 10 | 50 | | II. | Tr. | Eg.* | | 11 | 49 | | I. | Tr. | In.* | 24 | 5 | 18 | | I. | Oc. | Dis. |
| | 18 | 16 | 44.4 | I. | Ec. | Dis. | | 13 | 57 | | I. | Sh. | Eg.* | | 7 | 37 | 59.6 | I. | Ec. | Re. |
| | 20 | 44 | | I. | Oc. | Re. | | 14 | 0 | | I. | Tr. | Eg.* | | 21 | 43 | | III. | Oc. | Dis. |
| 5 | 15 | 22 | | I. | Sh. | In.* | | 23 | 33 | | II. | Sh. | In. | 25 | 0 | 9 | 36.1 | III. | Ec. | Re. |
| | 15 | 39 | | I. | Tr. | In.* | | 23 | 41 | | II. | Tr. | In. | | 2 | 25 | | I. | Tr. | In. |
| | 17 | 35 | | I. | Sh. | Eg | 15 | 2 | 8 | | II. | Sh. | Eg. | | 2 | 36 | | I. | Sh. | In. |
| | 17 | 50 | | I. | Tr. | Eg. | | 2 | 12 | | II. | Tr. | Eg. | | 4 | 36 | | I. | Tr. | Eg. |
| 6 | 1 | 52 | 25.8 | II. | Ec. | Dis. | | 9 | 7 | 42.7 | I. | Ec. | Dis.* | | 4 | 48 | | I. | Sh. | Eg. |
| | 4 | 54 | | II. | Oc. | Re. | | 11 | 20 | | I. | Oc. | Re.* | | 15 | 2 | | II. | Tr. | In.* |
| | 12 | 45 | 11.3 | I. | Ec. | Dis.* | 16 | 6 | 13 | | I. | Sh. | In. | | 15 | 25 | | II. | Sh. | In. |
| | 15 | 10 | | I. | Oc. | Re.* | | 6 | 15 | | I. | Tr. | In. | | 17 | 34 | | II. | Tr. | Eg. |
| 7 | 0 | 11 | | III. | Sh. | In. | | 8 | 26 | | I. | Sh. | Eg.* | | 18 | 0 | | II. | Sh. | Eg. |
| | 1 | 23 | | III. | Tr. | In. | | 8 | 26 | | I. | Tr. | Eg.* | | 23 | 44 | | I. | Oc. | Dis. |
| | 2 | 9 | | III. | Sh. | Eg. | | 17 | 45 | | II. | Oc. | Dis. | 26 | 2 | 6 | 32.9 | I. | Ec. | Re. |
| | 2 | 52 | | III. | Tr. | Eg. | | 20 | 17 | | II. | Oc. | Re. | | 20 | 51 | | I. | Tr. | In. |
| | 9 | 50 | | I. | Sh. | In.* | 17 | 3 | 34 | | I. | Oc. | Dis. | | 21 | 5 | | I. | Sh. | In. |
| | 10 | 5 | | I. | Tr. | In.* | | 5 | 45 | | I. | Oc. | Re. | | 23 | 2 | | I. | Tr. | Eg. |
| | 12 | 3 | | I. | Sh. | Eg.* | | 18 | 28 | | III. | Oc. | Dis. | | 23 | 17 | | I. | Sh. | Eg. |
| | 12 | 16 | | I. | Tr. | Eg.* | | 20 | 11 | 12.0 | III. | Ec. | Re. | 27 | 9 | 8 | | II. | Oc. | Dis.* |
| | 20 | 59 | | II. | Sh. | In. | 18 | 0 | 41 | | I. | Tr. | In. | | 12 | 9 | 13.1 | II. | Ec. | Re.* |
| | 21 | 27 | | II. | Tr. | In. | | 0 | 42 | | I. | Sh. | In. | | 18 | 10 | | I. | Oc. | Dis. |
| | 23 | 33 | | II. | Sh. | Eg. | | 2 | 52 | | I. | Tr | Eg. | | 20 | 35 | 3.8 | I. | Ec. | Re. |
| | 23 | 57 | | II. | Tr. | Eg. | | 2 | 54 | | I. | Sh. | Eg. | 28 | 11 | 9 | | III. | Tr. | In.* |
| 8 | 7 | 13 | 43.3 | I. | Ec. | Dis | | 12 | 48 | | II. | Tr. | In.* | | 12 | 7 | | III. | Sh. | In.* |
| | 9 | 36 | | I. | Oc. | Re.* | | 12 | 51 | | II. | Sh. | In.* | | 12 | 49 | | III. | Tr. | Eg.* |
| 9 | 4 | 19 | | I. | Sh. | In. | | 15 | 19 | | II. | Tr. | Eg.* | | 14 | 5 | | III. | Sh. | Eg.* |
| | 4 | 31 | | I. | Tr. | In. | | 15 | 25 | | II. | Sh. | Eg.* | | 15 | 17 | | I. | Tr. | In.* |
| | 6 | 32 | | I. | Sh. | Eg. | | 22 | 0 | | I. | Oc. | Dis. | | 15 | 33 | | I. | Sh. | In. |
| | 6 | 42 | | I. | Tr. | Eg. | 19 | 0 | 12 | 25.8 | I. | Ec. | Re. | | 17 | 28 | | I. | Tr. | Eg. |
| | 15 | 10 | 5.5 | II. | Ec. | Dis.* | | 19 | 7 | | I. | Tr. | In. | | 17 | 45 | | I. | Sh. | Eg. |
| | 18 | 2 | | II. | Oc. | Re. | | 19 | 11 | | I. | Sh. | In. | 29 | 4 | 9 | | II. | Tr. | In. |
| 10 | 1 | 42 | 10.2 | I. | Ec. | Dis. | | 21 | 18 | | I. | Tr. | Eg. | | 4 | 43 | | II. | Sh. | In. |
| | 4 | 2 | | I. | Oc. | Re. | | 21 | 23 | | I. | Sh. | Eg. | | 6 | 41 | | II. | Tr. | Eg. |
| | 14 | 30 | 19.8 | III. | Ec. | Dis.* | 20 | 6 | 53 | | II. | Oc. | Dis. | | 7 | 18 | | II. | Sh. | Eg. |
| | 16 | 45 | | III. | Oc. | Re. | | 9 | 33 | 24.8 | II. | Ec. | Re.* | | 12 | 36 | | I. | Oc. | Dis.* |
| | 22 | 47 | | I. | Sh. | In. | | 16 | 26 | | I. | Oc. | Dis. | | 15 | 3 | 40.0 | I. | Ec. | Re.* |
| | 22 | 57 | | I. | Tr. | In. | | 18 | 40 | 55.0 | I. | Ec. | Re. | 30 | 9 | 43 | | I. | Tr. | In.* |
| 11 | 1 | 0 | | I. | Sh. | Eg | 21 | 7 | 54 | | III. | Tr. | In. | | 10 | 2 | | I. | Sh. | In.* |
| | 1 | 8 | | I. | Tr. | Eg | | 8 | 8 | | III. | Sh. | In.* | | 11 | 54 | | I. | Tr. | Eg.* |
| | 10 | 16 | | II. | Sh. | In.* | | 9 | 30 | | III. | Tr. | Eg.* | | 12 | 14 | | I. | Sh. | Eg.* |
| | 10 | 34 | | II. | Tr. | In.* | | 10 | 6 | | III. | Sh. | Eg.* | | 22 | 16 | | II. | Oc. | Dis. |
| | 12 | 50 | | II. | Sh. | Eg.* | | 13 | 33 | | I. | Tr. | In.* | 31 | 1 | 27 | 32.4 | II. | Ec. | Re. |
| | 13 | 5 | | II. | Tr. | Eg.* | | 13 | 39 | | I. | Sh. | In.* | | 7 | 2 | | I. | Oc. | Dis. |
| | 20 | 10 | 41.1 | I. | Ec. | Dis. | | 15 | 44 | | I. | Tr. | Eg.* | | 9 | 32 | 11.5 | I. | Ec. | Re.* |
| | 22 | 28 | | I. | Oc. | Re. | | | | | | | | | | | | | | |

**JUNE.**

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 58 | | III. | Oc. | Dis. | 1 | 6 | 42 | | I. | Sh. | Eg. | 2 | 1 | 28 | | I. | Oc. | Dis. |
| | 4 | 8 | 11.2 | III. | Ec. | Re. | | 17 | 17 | | II. | Tr. | In. | | 4 | 0 | 46.0 | I. | Ec. | Re. |
| | 4 | 10 | | I. | Tr. | In. | | 18 | 0 | | II. | Sh. | In. | | 22 | 36 | | I. | Tr. | In. |
| | 4 | 30 | | I. | Sh. | In. | | 19 | 48 | | II. | Tr. | Eg. | | 22 | 59 | | I. | Sh. | In. |
| | 6 | 20 | | I. | Tr. | Eg. | | 20 | 35 | | II. | Sh. | Eg. | 3 | 0 | 46 | | I. | Tr. | Eg. |

In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; * Visible at Washington.

## WASHINGTON MEAN TIME.

### JUNE.

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **3** | 1 | 11 | | I. | Sh. | Eg. | **12** | 9 | 52 | | II. | Sh. | In.* | **22** | 10 | 15 | | I. | Sh. | In.* |
| | 11 | 24 | | II. | Oc. | Dis.* | | 11 | 12 | | II. | Tr. | Eg.* | | 11 | 2 | | III. | Oc | Dis.* |
| | 14 | 45 | 16.6 | II. | Ec. | Re.* | | 12 | 27 | | II. | Sh. | Eg.* | | 11 | 38 | | I. | Tr. | Eg * |
| | 19 | 55 | | I. | Oc. | Dis. | | 16 | 6 | | I. | Oc. | Dis. | | 12 | 26 | | I. | Sh. | Eg.* |
| | 22 | 29 | 18.3 | I. | Ec. | Re. | | 18 | 52 | 16.1 | I. | Ec. | Re. | | 12 | 53 | | III. | Oc | Re.* |
| **4** | 14 | 27 | | III. | Tr. | In.* | **13** | 13 | 14 | | I. | Tr. | In.* | | 14 | 20 | 21.8 | III. | Ec. | Dis. |
| | 16 | 6 | | III. | Sh. | In. | | 13 | 50 | | I. | Sh. | In.* | | 16 | 5 | 53.0 | III. | Ec. | Re. |
| | 16 | 10 | | III. | Tr. | Eg. | | 15 | 25 | | I. | Tr. | Eg. | **23** | 0 | 6 | | II. | Tr. | In. |
| | 17 | 2 | | I. | Tr. | In. | | 16 | 3 | | I. | Sh. | Eg. | | 1 | 44 | | II. | Sh. | In. |
| | 17 | 28 | | I. | Sh. | In. | **14** | 2 | 50 | | II. | Oc. | Dis. | | 2 | 39 | | II. | Tr. | Eg. |
| | 18 | 4 | | III. | Sh. | Eg. | | 6 | 40 | 14.9 | II. | Ec. | Re. | | 4 | 20 | | II. | Sh. | Eg. |
| | 19 | 13 | | I. | Tr. | Eg. | | 10 | 32 | | I. | Oc. | Dis.* | | 6 | 45 | | I. | Oc. | Dis. |
| | 19 | 40 | | I. | Sh. | Eg. | | 13 | 20 | 50.6 | I. | Ec. | Re.* | | 9 | 43 | 56.2 | I. | Ec. | Re.* |
| **5** | 6 | 24 | | II. | Tr. | In. | **15** | 7 | 38 | | III. | Oc. | Dis | **24** | 3 | 53 | | I. | Tr. | In. |
| | 7 | 17 | | II. | Sh. | In. | | 7 | 40 | | I. | Tr. | In. | | 4 | 43 | | I. | Sh | In. |
| | 8 | 56 | | II. | Tr. | Eg.* | | 8 | 19 | | I. | Sh. | In.* | | 6 | 5 | | I. | Tr. | Eg. |
| | 9 | 52 | | II. | Sh. | Eg.* | | 9 | 26 | | III. | Oc. | Re.* | | 6 | 55 | | I. | Sh. | Eg |
| | 14 | 21 | | I. | Oc. | Dis.* | | 9 | 52 | | I. | Tr. | Eg.* | | 18 | 19 | | II. | Oc. | Dis. |
| | 16 | 57 | 55.5 | I. | Ec. | Re. | | 10 | 21 | 40.0 | III. | Ec. | Dis.* | | 22 | 34 | 58.7 | II. | Ec. | Re. |
| **6** | 11 | 29 | | I. | Tr. | In.* | | 10 | 32 | | I. | Sh. | Eg.* | **25** | 1 | 12 | | I. | Oc. | Dis. |
| | 11 | 56 | | I. | Sh. | In.* | | 12 | 6 | 36.4 | III. | Ec. | Re.* | | 4 | 12 | 32.4 | I. | Ec. | Re. |
| | 13 | 39 | | I. | Tr. | Eg.* | | 21 | 48 | | II. | Tr. | In. | | 22 | 20 | | I. | Tr. | In. |
| | 14 | 8 | | I. | Sh. | Eg.* | | 23 | 9 | | II. | Sh. | In. | | 23 | 12 | | I. | Sh. | In. |
| **7** | 0 | 32 | | II. | Oc. | Dis. | **16** | 0 | 21 | | II. | Tr. | Eg. | **26** | 0 | 32 | | I. | Tr. | Eg. |
| | 4 | 3 | 45.8 | II. | Ec. | Re. | | 1 | 45 | | II. | Sh. | Eg. | | 0 | 34 | | III. | Tr. | In. |
| | 8 | 47 | | I. | Oc. | Dis.* | | 4 | 58 | | I. | Oc. | Dis. | | 1 | 24 | | I. | Sh. | Eg. |
| | 11 | 26 | 28.4 | I. | Ec. | Re.* | | 7 | 49 | 27.5 | I. | Ec. | Re. | | 2 | 28 | | III. | Tr. | Eg. |
| **8** | 4 | 16 | | III. | Oc. | Dis. | **17** | 2 | 7 | | I. | Tr. | In. | | 4 | 2 | | III. | Sh. | In. |
| | 5 | 55 | | I. | Tr. | In. | | 2 | 48 | | I. | Sh. | In. | | 6 | 2 | | III. | Sh. | Eg. |
| | 6 | 1 | | III. | Oc. | Re. | | 4 | 18 | | I. | Tr. | Eg. | | 13 | 15 | | II. | Tr. | In.* |
| | 6 | 22 | 38.3 | III. | Ec. | Dis. | | 5 | 0 | | I. | Sh. | Eg. | | 15 | 2 | | II. | Sh. | In. |
| | 6 | 25 | | I. | Sh. | In. | | 15 | 59 | | II. | Oc. | Dis. | | 15 | 48 | | II. | Tr. | Eg. |
| | 8 | 5 | | I. | Tr. | Eg. | | 19 | 58 | 10.5 | II. | Ec. | Re. | | 17 | 37 | | II. | Sh. | Eg. |
| | 8 | 7 | 1.7 | III. | Ec. | Re. | | 23 | 25 | | I. | Oc. | Dis. | | 19 | 39 | | I. | Oc. | Dis. |
| | 8 | 37 | | I. | Sh. | Eg.* | **18** | 2 | 18 | 2.5 | I. | Ec. | Re. | | 22 | 41 | 12.7 | I. | Ec. | Re. |
| | 19 | 32 | | II. | Tr. | In. | | 20 | 33 | | I. | Tr. | In. | **27** | 16 | 47 | | I. | Tr. | In. |
| | 20 | 35 | | II. | Sh. | In. | | 21 | 9 | | III. | Tr. | In. | | 17 | 40 | | I. | Sh. | In. |
| | 22 | 4 | | II. | Tr | Eg. | | 21 | 17 | | I. | Sh. | In. | | 18 | 59 | | I. | Tr. | Eg. |
| | 23 | 10 | | II. | Sh. | Eg. | | 22 | 45 | | I. | Tr. | Eg. | | 19 | 53 | | I. | Sh. | Eg. |
| **9** | 3 | 13 | | I. | Oc. | Dis. | | 22 | 59 | | III. | Tr. | Eg. | **28** | 7 | 30 | | II. | Oc. | Dis. |
| | 5 | 55 | 4.0 | I. | Ec. | Re. | | 23 | 29 | | I. | Sh. | Eg. | | 11 | 53 | 54.8 | II. | Ec. | Re.* |
| **10** | 0 | 21 | | I. | Tr. | In. | **19** | 0 | 3 | | III. | Sh. | In. | | 14 | 5 | | I. | Oc. | Dis. |
| | 0 | 54 | | I. | Sh. | In. | | 2 | 2 | | III. | Sh. | Eg. | | 17 | 9 | 49.6 | I. | Ec. | Re. |
| | 2 | 32 | | I. | Tr. | Eg. | | 10 | 57 | | II. | Tr. | In.* | **29** | 11 | 14 | | I. | Tr. | In.* |
| | 3 | 6 | | I. | Sh. | Eg. | | 12 | 27 | | II. | Sh. | In.* | | 12 | 9 | | I. | Sh. | In.* |
| | 13 | 41 | | II. | Oc. | Dis.* | | 13 | 30 | | II. | Tr. | Eg.* | | 13 | 26 | | I. | Tr. | Eg. |
| | 17 | 21 | 35.8 | II. | Ec. | Re. | | 15 | 2 | | II. | Sh. | Eg | | 14 | 22 | | I. | Sh. | Eg. |
| | 21 | 39 | | I. | Oc. | Dis. | | 17 | 52 | | I. | Oc. | Dis. | | 14 | 29 | | III. | Oc. | Dis. |
| **11** | 0 | 23 | 37.6 | I. | Ec. | Re. | | 20 | 46 | 42.2 | I. | Ec. | Re. | | 16 | 24 | | III. | Oc. | Re. |
| | 17 | 46 | | III. | Tr. | In. | **20** | 15 | 0 | | I. | Tr. | In. | | 18 | 19 | 26.8 | III. | Ec. | Dis. |
| | 18 | 47 | | I. | Tr. | In. | | 15 | 46 | | I. | Sh. | In. | | 20 | 5 | 34.4 | III. | Ec. | Re. |
| | 19 | 22 | | I. | Sh. | In. | | 17 | 12 | | I. | Tr. | Eg. | **30** | 2 | 26 | | II. | Tr. | In. |
| | 19 | 33 | | III. | Tr. | Eg. | | 17 | 58 | | I. | Sh. | Eg. | | 4 | 19 | | II. | Sh. | In. |
| | 20 | 5 | | III. | Sh. | In. | **21** | 5 | 9 | | II. | Oc. | Dis. | | 4 | 59 | | II. | Tr. | Eg. |
| | 20 | 58 | | I. | Tr. | Eg. | | 9 | 16 | 58.5 | II. | Ec. | Re.* | | 6 | 55 | | II. | Sh. | Eg. |
| | 21 | 34 | | I. | Sh. | Eg. | | 12 | 18 | | I. | Oc. | Dis.* | | 8 | 32 | | I. | Oc. | Dis.* |
| | 22 | 3 | | III. | Sh. | Eg. | | 15 | 15 | 18.2 | I. | Ec. | Re. | | 11 | 38 | 28.2 | I. | Ec. | Re.* |
| **12** | 8 | 40 | | II. | Tr. | In.* | **22** | 9 | 26 | | I. | Tr. | In.* | | | | | | | |

### JULY.

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 5 | 41 | | I. | Tr. | In. | **2** | 1 | 11 | 59.3 | II. | Ec. | Re. | **3** | 2 | 20 | | I. | Tr. | Eg. |
| | 6 | 38 | | I. | Sh. | In. | | 2 | 58 | | I. | Oc. | Dis. | | 3 | 20 | | I. | Sh. | Eg. |
| | 7 | 53 | | I. | Tr. | Eg. | | 6 | 7 | 5.3 | I. | Ec. | Re. | | 4 | 4 | | III. | Tr. | In. |
| | 8 | 51 | | I. | Sh. | Eg.* | **3** | 0 | 8 | | I. | Tr. | In. | | 6 | 1 | | III. | Tr. | Eg. |
| | 20 | 41 | | II. | Oc. | Dis. | | 1 | 6 | | I. | Sh. | In. | | 8 | 1 | | III. | Sh. | In. |

NOTE.—For Phases of Eclipses see pages 462 and 463. * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow;

WASHINGTON MEAN TIME.

JULY.

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **3** | 10 | 1 | | III. | Sh. | Eg.* | **13** | 14 | 53 | | I. | Tr. | In. | **22** | 12 | 24 | | I. | Sh. | In. |
| | 15 | 36 | | II. | Tr. | In. | | 16 | 0 | | I. | Sh. | In. | | 13 | 25 | | I. | Tr. | Eg. |
| | 17 | 36 | | II. | Sh. | In. | | 17 | 5 | | I. | Tr. | Eg. | | 14 | 37 | | I. | Sh. | Eg. |
| | 18 | 10 | | II. | Tr. | Eg. | | 18 | 12 | | I. | Sh. | Eg. | **23** | 4 | 2 | | II. | Oc. | Dis. |
| | 20 | 12 | | II. | Sh. | Eg. | | 21 | 38 | | III. | Oc. | Dis. | | 8 | 29 | | I. | Oc. | Dis.* |
| | 21 | 26 | | I. | Oc. | Dis. | | 23 | 39 | | III. | Oc. | Re. | | 9 | 4 | 3.9 | II. | Ec. | Re.* |
| **4** | 0 | 35 | 46.3 | I. | Ec. | Re. | **14** | 2 | 16 | 31.0 | III. | Ec. | Dis. | | 11 | 51 | 4.9 | I. | Ec. | Re.* |
| | 18 | 36 | | I. | Tr. | In. | | 4 | 3 | 55.6 | III. | Ec. | Re. | **24** | 5 | 40 | | I. | Tr. | In. |
| | 19 | 35 | | I. | Sh. | In. | | 7 | 11 | | II. | Tr. | In. | | 6 | 52 | | I. | Sh. | In. |
| | 20 | 48 | | I. | Tr. | Eg. | | 9 | 28 | | II. | Sh | In.* | | 7 | 53 | | I. | Tr. | Eg.* |
| | 21 | 48 | | I. | Sh. | Eg. | | 9 | 46 | | II. | Tr. | Eg.* | | 9 | 5 | | I. | Sh. | Eg.* |
| **5** | 9 | 54 | | II. | Oc. | Dis.* | | 12 | 4 | | II. | Sh. | Eg.* | | 15 | 4 | | III. | Tr. | In. |
| | 14 | 31 | 2.7 | II. | Ec. | Re. | | 12 | 10 | | I. | Oc. | Dis.* | | 17 | 10 | | III. | Tr. | Eg. |
| | 15 | 53 | | I. | Oc. | Dis. | | 15 | 27 | 43.3 | I. | Ec. | Re. | | 20 | 0 | | III. | Sh. | In. |
| | 19 | 4 | 24.6 | I. | Ec. | Re. | **15** | 9 | 20 | | I. | Tr. | In.* | | 22 | 2 | | III. | Sh. | Eg. |
| **6** | 13 | 3 | | I. | Tr. | In. | | 10 | 28 | | I. | Sh. | In.* | | 22 | 51 | | II. | Tr. | In. |
| | 14 | 4 | | I. | Sh. | In. | | 11 | 33 | | I. | Tr. | Eg.* | **25** | 1 | 20 | | II. | Sh. | In. |
| | 15 | 15 | | I. | Tr. | Eg. | | 12 | 41 | | I. | Sh. | Eg. | | 1 | 27 | | II. | Tr. | Eg. |
| | 16 | 17 | | I. | Sh. | Eg. | **16** | 1 | 33 | | II. | Oc. | Dis. | | 2 | 57 | | I. | Oc. | Dis. |
| | 18 | 1 | | III. | Oc. | Dis. | | 6 | 26 | 33.7 | II. | Ec. | Re. | | 3 | 56 | | II. | Sh. | Eg. |
| | 19 | 59 | | III. | Oc. | Re. | | 6 | 38 | | I. | Oc. | Dis. | | 6 | 19 | 47.4 | I. | Ec. | Re. |
| | 22 | 18 | 1.3 | III. | Ec. | Dis. | | 9 | 56 | 22.4 | I. | Ec. | Re.* | **26** | 0 | 8 | | I. | Tr. | In. |
| **7** | 0 | 4 | 46.7 | III. | Ec. | Re. | **17** | 3 | 48 | | I. | Tr. | In. | | 1 | 21 | | I. | Sh. | In. |
| | 4 | 47 | | II. | Tr. | In. | | 4 | 57 | | I. | Sh. | In. | | 2 | 21 | | I. | Tr. | Eg. |
| | 6 | 53 | | II. | Sh. | In. | | 6 | 1 | | I. | Tr. | Eg. | | 3 | 34 | | I. | Sh. | Eg. |
| | 7 | 22 | | II. | Tr. | Eg. | | 7 | 10 | | I. | Sh. | Eg. | | 17 | 18 | | II. | Oc. | Dis. |
| | 9 | 29 | | II. | Sh. | Eg.* | | 11 | 20 | | III. | Tr. | In.* | | 21 | 25 | | I. | Oc. | Dis. |
| | 10 | 21 | | I. | Oc. | Dis.* | | 13 | 23 | | III. | Tr. | Eg. | | 22 | 23 | 23.6 | II. | Ec. | Re. |
| | 13 | 33 | 4.0 | I. | Ec. | Re | | 16 | 1 | | III. | Sh. | In. | **27** | 0 | 48 | 28.2 | I. | Ec. | Re. |
| **8** | 7 | 31 | | I. | Tr. | In. | | 18 | 2 | | III. | Sh. | Eg. | | 18 | 36 | | I. | Tr. | In. |
| | 8 | 33 | | I. | Sh. | In.* | | 20 | 24 | | II. | Tr. | In. | | 19 | 50 | | I. | Sh. | In. |
| | 9 | 43 | | I. | Tr. | Eg.* | | 22 | 45 | | II. | Sh. | In. | | 20 | 50 | | I. | Tr | Eg. |
| | 10 | 46 | | I. | Sh. | Eg.* | | 22 | 59 | | II. | Tr. | Eg. | | 22 | 3 | | I. | Sh. | Eg. |
| | 23 | 6 | | II. | Oc. | Dis. | **18** | 1 | 5 | | I. | Oc. | Dis. | **28** | 5 | 4 | | III. | Oc. | Dis. |
| **9** | 3 | 49 | 11.6 | II. | Ec. | Re. | | 1 | 22 | | II. | Sh. | Eg. | | 7 | 11 | | III. | Oc. | Re. |
| | 4 | 48 | | I. | Oc. | Dis. | | 4 | 25 | 4.5 | I. | Ec. | Re. | | 10 | 13 | 54.7 | III. | Ec. | Dis.* |
| | 8 | 1 | 42.2 | I. | Ec. | Re.* | | 22 | 16 | | I. | Tr. | In. | | 12 | 2 | 41.9 | III. | Ec. | Re. |
| **10** | 1 | 58 | | I. | Tr. | In. | | 23 | 26 | | I. | Sh. | In. | | 12 | 5 | | II. | Tr. | In. |
| | 3 | 2 | | I. | Sh. | In | **19** | 0 | 29 | | I. | Tr. | Eg. | | 14 | 37 | | II. | Sh. | In. |
| | 4 | 10 | | I. | Tr. | Eg. | | 1 | 39 | | I. | Sh. | Eg. | | 14 | 41 | | II. | Tr. | Eg. |
| | 5 | 15 | | I. | Sh. | Eg. | | 14 | 48 | | II. | Oc. | Dis. | | 15 | 53 | | I. | Oc. | Dis. |
| | 7 | 40 | | III. | Tr. | In. | | 19 | 33 | | I. | Oc. | Dis. | | 17 | 14 | | II. | Sh. | Eg. |
| | 9 | 40 | | III. | Tr. | Eg.* | | 19 | 45 | 49.3 | II. | Ec. | Re. | | 19 | 17 | 8.7 | I. | Ec. | Re. |
| | 12 | 1 | | III. | Sh. | In.* | | 22 | 53 | 44.8 | I. | Ec. | Re. | **29** | 13 | 4 | | I. | Tr. | In. |
| | 14 | 2 | | III. | Sh. | Eg. | **20** | 16 | 44 | | I. | Tr. | In. | | 14 | 19 | | I. | Sh. | In. |
| | 17 | 59 | | II. | Tr. | In. | | 17 | 55 | | I. | Sh. | In. | | 15 | 18 | | I. | Tr. | Eg. |
| | 20 | 11 | | II. | Sh. | In. | | 18 | 57 | | I. | Tr. | Eg. | | 16 | 32 | | I. | Sh. | Eg |
| | 20 | 34 | | II. | Tr. | Eg | | 20 | 8 | | I. | Sh. | Eg. | **30** | 6 | 34 | | II. | Oc. | Dis. |
| | 22 | 47 | | II. | Sh. | Eg. | **21** | 1 | 19 | | III. | Oc. | Dis. | | 10 | 21 | | I. | Oc. | Dis.* |
| | 23 | 15 | | I. | Oc. | Dis. | | 3 | 23 | | III. | Oc. | Re. | | 11 | 41 | 40.8 | II. | Ec. | Re. |
| **11** | 2 | 30 | 24.0 | I. | Ec. | Re. | | 6 | 15 | 8.3 | III. | Ec. | Dis. | | 13 | 45 | 48.7 | I. | Ec. | Re. |
| | 20 | 26 | | I. | Tr. | In. | | 8 | 3 | 13.5 | III. | Ec. | Re.* | **31** | 7 | 32 | | I. | Tr. | In. |
| | 21 | 31 | | I. | Sh. | In. | | 9 | 37 | | II. | Tr. | In.* | | 8 | 48 | | I. | Sh. | In.* |
| | 22 | 38 | | I. | Tr. | Eg. | | 12 | 3 | | II. | Sh. | In. | | 9 | 46 | | I. | Tr. | Eg.* |
| | 23 | 44 | | I. | Sh. | Eg. | | 12 | 13 | | II. | Tr. | Eg | | 11 | 1 | | I. | Sh. | Eg.* |
| **12** | 12 | 20 | | II. | Oc. | Dis.* | | 14 | 1 | | I. | Oc. | Dis. | | 18 | 52 | | III. | Tr. | In. |
| | 17 | 8 | 21.3 | II. | Ec. | Re. | | 14 | 39 | | II. | Sh. | Eg. | | 21 | 1 | | III. | Tr. | Eg. |
| | 17 | 43 | | I. | Oc. | Dis. | | 17 | 22 | 25.2 | I. | Ec. | Re. | | 23 | 59 | | III. | Sh. | In. |
| | 20 | 59 | 3.4 | I. | Ec. | Re. | **22** | 11 | 12 | | I. | Tr. | In.* | | | | | | | |

AUGUST.

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 1 | 20 | | II. | Tr. | In. | **1** | 4 | 49 | | I. | Oc. | Dis. | **2** | 3 | 17 | | I. | Sh. | In. |
| | 2 | 2 | | III. | Sh. | Eg. | | 6 | 31 | | II. | Sh. | Eg. | | 4 | 14 | | I. | Tr. | Eg. |
| | 3 | 54 | | II. | Sh. | In. | | 8 | 14 | 31.1 | I. | Ec. | Re.* | | 5 | 30 | | I. | Sh. | Eg. |
| | 3 | 56 | | II. | Tr. | Eg. | **2** | 2 | 1 | | I. | Tr. | In. | | 19 | 51 | | II. | Oc. | Dis. |

In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; * Visible at Washington.

## WASHINGTON MEAN TIME.

### AUGUST.

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2** | 22 | 27 | | II. | Oc. | Re. | **11** | 22 | 23 | | II. | Sh. | Eg. | **22** | 6 | 43 | | III. | Tr. | In. |
| | 22 | 27 | 26.5 | II. | Ec. | Dis. | | 23 | 6 | 38.5 | I. | Ec. | Re. | | 8 | 56 | | III. | Tr. | Eg.* |
| | 23 | 17 | | I. | Oc. | Dis. | **12** | 16 | 53 | | I. | Tr. | In. | | 9 | 1 | | II. | Tr. | In.* |
| **3** | 1 | 1 | 3.9 | II. | Ec. | Re. | | 18 | 10 | | I. | Sh. | In. | | 10 | 32 | | I. | Oc. | Dis. |
| | 2 | 43 | 12.3 | I. | Ec. | Re. | | 19 | 6 | | I. | Tr. | Eg. | | 11 | 38 | | II. | Sh. | In. |
| | 20 | 29 | | I. | Tr. | In. | | 20 | 23 | | I. | Sh. | Eg. | | 11 | 39 | | II. | Tr. | Eg. |
| | 21 | 45 | | I. | Sh. | In. | **13** | 11 | 44 | | II. | Oc. | Dis. | | 11 | 57 | | III. | Sh. | In. |
| | 22 | 42 | | I. | Tr. | Eg. | | 14 | 8 | | I. | Oc. | Dis. | | 13 | 58 | 47.3 | I. | Ec. | Re. |
| | 23 | 58 | | I. | Sh. | Eg. | | 14 | 21 | | II. | Oc. | Re. | | 14 | 2 | | III. | Sh. | Eg. |
| **4** | 8 | 55 | | III. | Oc | Dis.* | | 14 | 23 | 8.7 | II. | Ec. | Dis. | | 14 | 15 | | II. | Sh. | Eg. |
| | 11 | 5 | | III. | Oc. | Re. | | 16 | 57 | 7.1 | II. | Ec. | Re. | **23** | 7 | 46 | | I. | Tr. | In.* |
| | 14 | 13 | 19.7 | III. | Ec. | Dis. | | 17 | 35 | 19.1 | I. | Ec. | Re. | | 9 | 3 | | I. | Sh. | In.* |
| | 14 | 36 | | II. | Tr. | In. | **14** | 11 | 21 | | I. | Tr. | In. | | 9 | 59 | | I. | Tr. | Eg. |
| | 16 | 2 | 50.5 | III. | Ec. | Re. | | 12 | 38 | | I. | Sh. | In. | | 11 | 16 | | I. | Sh. | Eg. |
| | 17 | 12 | | II. | Sh | In. | | 13 | 34 | | I. | Tr. | Eg. | **24** | 3 | 42 | | II. | Oc. | Dis. |
| | 17 | 12 | | II. | Tr. | Eg. | | 14 | 51 | | I. | Sh. | Eg. | | 5 | 1 | | I. | Oc. | Dis. |
| | 17 | 45 | | I. | Oc. | Dis. | **15** | 2 | 42 | | III. | Tr. | In. | | 6 | 20 | | II. | Oc. | Re. |
| | 19 | 43 | | II. | Sh. | Eg. | | 4 | 54 | | III. | Tr. | Eg. | | 6 | 20 | 2.5 | II. | Ec. | Dis. |
| | 21 | 11 | 53.1 | I. | Ec. | Re. | | 6 | 26 | | II. | Tr. | In. | | 8 | 27 | 29.4 | I. | Ec. | Re.* |
| **5** | 14 | 58 | | I. | Tr. | In. | | 7 | 58 | | III. | Sh. | In.* | | 8 | 54 | 21.1 | II. | Ec. | Re.* |
| | 16 | 14 | | I. | Sh. | In. | | 8 | 36 | | I. | Oc. | Dis.* | **25** | 2 | 15 | | I. | Tr. | In. |
| | 17 | 10 | | I. | Tr. | Eg. | | 9 | 3 | | II. | Tr. | Eg.* | | 3 | 31 | | I. | Sh. | In. |
| | 18 | 27 | | I. | Sh. | Eg. | | 9 | 3 | | II. | Sh. | In.* | | 4 | 28 | | I. | Tr. | Eg |
| **6** | 9 | 8 | | II. | Oc. | Dis.* | | 10 | 2 | | III. | Sh. | Eg.* | | 5 | 44 | | I. | Sh | Eg. |
| | 11 | 44 | | II. | Oc. | Re. | | 11 | 40 | | II. | Sh. | Eg. | | 20 | 51 | | III. | Oc. | Dis. |
| | 11 | 45 | 38.0 | II. | Ec. | Dis. | | 12 | 4 | 1.6 | I. | Ec. | Re. | | 22 | 20 | | II. | Tr. | In. |
| | 12 | 14 | | I. | Oc. | Dis. | **16** | 5 | 50 | | I. | Tr. | In. | | 23 | 6 | | III. | Oc. | Re. |
| | 14 | 19 | 22.6 | II. | Ec. | Re. | | 7 | 7 | | I. | Sh. | In. | | 23 | 30 | | I. | Oc | Dis. |
| | 15 | 40 | 33.4 | I. | Ec. | Re. | | 8 | 3 | | I. | Tr. | Eg.* | **26** | 0 | 55 | | II. | Sh. | In |
| **7** | 9 | 27 | | I. | Tr. | In.* | | 9 | 20 | | I. | Sh. | Eg.* | | 0 | 57 | | II. | Tr. | Eg. |
| | 10 | 43 | | I. | Sh. | In.* | **17** | 1 | 3 | | II. | Oc. | Dis. | | 2 | 10 | 18.9 | III. | Ec. | Dis. |
| | 11 | 39 | | I. | Tr. | Eg. | | 3 | 5 | | I. | Oc. | Dis. | | 2 | 56 | 10.1 | I. | Ec. | Re. |
| | 12 | 56 | | I. | Sh. | Eg. | | 3 | 40 | | II. | Oc. | Re. | | 3 | 33 | | II. | Sh | Eg. |
| | 22 | 45 | | III. | Tr. | In. | | 3 | 42 | 29.0 | II. | Ec. | Dis. | | 4 | 2 | 8.3 | III. | Ec. | Re. |
| **8** | 0 | 55 | | III. | Tr. | Eg. | | 6 | 16 | 34.2 | II. | Ec. | Re. | | 20 | 44 | | I. | Tr | In. |
| | 3 | 52 | | II. | Tr. | In. | | 6 | 32 | 43.6 | I. | Ec. | Re. | | 22 | 0 | | I. | Sh. | In. |
| | 3 | 58 | | III. | Sh. | In. | **18** | 0 | 19 | | I. | Tr. | In. | | 22 | 57 | | I. | Tr. | Eg. |
| | 6 | 2 | | III. | Sh. | Eg. | | 1 | 36 | | I. | Sh. | In. | **27** | 0 | 13 | | I. | Sh | Eg. |
| | 6 | 29 | | II. | Tr. | Eg. | | 2 | 32 | | I. | Tr. | Eg. | | 17 | 2 | | II. | Oc. | Dis. |
| | 6 | 29 | | II. | Sh. | In. | | 3 | 49 | | I. | Sh. | Eg. | | 17 | 59 | | I. | Oc. | Dis. |
| | 6 | 42 | | I. | Oc. | Dis. | | 16 | 49 | | III. | Oc. | Dis. | | 21 | 24 | 50.9 | I. | Ec. | Re. |
| | 9 | 6 | | II. | Sh. | Eg.* | | 19 | 2 | | III. | Oc. | Re. | | 22 | 12 | 40.9 | II. | Ec. | Re |
| | 10 | 9 | 16.0 | I. | Ec. | Re.* | | 19 | 43 | | II. | Tr | In. | **28** | 15 | 14 | | I. | Tr. | In. |
| **9** | 3 | 55 | | I. | Tr. | In. | | 21 | 34 | | I. | Oc. | Dis. | | 16 | 29 | | I. | Sh. | In. |
| | 5 | 12 | | I. | Sh. | In. | | 22 | 11 | 36.4 | III. | Ec. | Dis. | | 17 | 27 | | I. | Tr. | Eg |
| | 6 | 8 | | I. | Tr. | Eg. | | 22 | 20 | | II. | Sh. | In. | | 18 | 42 | | I. | Sh. | Eg. |
| | 7 | 25 | | I. | Sh. | Eg. | | 22 | 21 | | II. | Tr. | Eg. | **29** | 10 | 48 | | III. | Tr. | In |
| | 22 | 26 | | II. | Oc. | Dis. | **19** | 0 | 2 | 38.4 | III. | Ec. | Re. | | 11 | 39 | | II. | Tr. | In. |
| **10** | 1 | 3 | | II. | Oc. | Re. | | 0 | 58 | | II. | Sh. | Eg. | | 12 | 28 | | I. | Oc. | Dis. |
| | 1 | 4 | 56.3 | II. | Ec. | Dis. | | 1 | 1 | 24.3 | I. | Ec. | Re. | | 13 | 3 | | III. | Tr. | Eg. |
| | 1 | 12 | | I. | Oc. | Dis. | | 18 | 48 | | I. | Tr. | In. | | 14 | 12 | | II. | Sh. | In |
| | 3 | 38 | 47.9 | II. | Ec. | Re. | | 20 | 5 | | I. | Sh. | In. | | 14 | 16 | | II. | Tr. | Eg. |
| | 4 | 37 | 57.6 | I. | Ec. | Re. | | 21 | 1 | | I. | Tr. | Eg. | | 15 | 53 | 32.8 | I. | Ec. | Re. |
| | 22 | 24 | | I. | Tr. | In. | | 22 | 18 | | I. | Sh. | Eg. | | 15 | 57 | | III. | Sh. | In. |
| | 23 | 41 | | I. | Sh. | In. | **20** | 14 | 22 | | II. | Oc. | Dis. | | 16 | 50 | | II. | Sh. | Eg |
| **11** | 0 | 37 | | I. | Tr. | Eg. | | 16 | 3 | | I. | Oc. | Dis. | | 18 | 2 | | III. | Sh. | Eg. |
| | 1 | 54 | | I. | Sh. | Eg. | | 16 | 59 | | II. | Oc. | Re. | **30** | 9 | 43 | | I. | Tr. | In. |
| | 12 | 50 | | III. | Oc. | Dis. | | 17 | 0 | 41.9 | II. | Ec. | Dis. | | 10 | 58 | | I. | Sh. | In. |
| | 15 | 1 | | III. | Oc. | Re. | | 19 | 30 | 5.0 | I. | Ec. | Re. | | 11 | 56 | | I. | Tr. | Eg. |
| | 17 | 9 | | II. | Tr. | In. | | 19 | 34 | 53.9 | II. | Ec. | Re. | | 13 | 11 | | I. | Sh. | Eg. |
| | 18 | 12 | 19.4 | III. | Ec. | Dis. | **21** | 13 | 17 | | I. | Tr | In. | **31** | 6 | 23 | | II. | Oc. | Dis. |
| | 19 | 39 | | I. | Oc. | Dis. | | 14 | 34 | | I. | Sh. | In. | | 6 | 57 | | I. | Oc. | Dis. |
| | 19 | 46 | | II. | Tr. | Eg. | | 15 | 30 | | I. | Tr. | Eg. | | 10 | 22 | 14.9 | I. | Ec. | Re. |
| | 19 | 46 | | II. | Sh. | In. | | 16 | 47 | | I. | Sh. | Eg. | | 11 | 32 | 7.2 | II. | Ec. | Re. |
| | 20 | 2 | 35.0 | III. | Ec. | Re. | | | | | | | | | | | | | | |

NOTE.—For Phases of Eclipses see pages 462 and 463. * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow;

## WASHINGTON MEAN TIME.

### SEPTEMBER.

| d | h | m | s | | | |
|---|---|---|---|---|---|---|
| 1 | 4 | 12 | | I. | Tr. | In. |
| | 5 | 27 | | I. | Sh. | In. |
| | 6 | 26 | | I. | Tr. | Eg. |
| | 7 | 40 | | I. | Sh. | Eg.* |
| 2 | 0 | 57 | | III. | Oc. | Dis. |
| | 0 | 58 | | II. | Tr. | In. |
| | 1 | 26 | | I. | Oc. | Dis. |
| | 3 | 13 | | III. | Oc. | Re. |
| | 3 | 30 | | II. | Sh. | In. |
| | 3 | 36 | | II. | Tr. | Eg. |
| | 4 | 50 | 55.4 | I. | Ec. | Re. |
| | 6 | 7 | | II. | Sh. | Eg. |
| | 6 | 8 | 53.4 | III. | Ec. | Dis |
| | 8 | 1 | 31.4 | III. | Ec. | Re.* |
| | 22 | 42 | | I. | Tr. | In. |
| | 23 | 56 | | I. | Sh. | In. |
| 3 | 0 | 55 | | I. | Tr. | Eg. |
| | 2 | 9 | | I. | Sh. | Eg. |
| | 19 | 44 | | II. | Oc. | Dis. |
| | 19 | 55 | | I. | Oc.* | Dis. |
| | 23 | 19 | 36.1 | I. | Ec. | Re. |
| 4 | 0 | 50 | 26.4 | II. | Ec. | Re. |
| | 17 | 11 | | I. | Tr. | In. |
| | 18 | 24 | | I. | Sh. | In. |
| | 19 | 24 | | I. | Tr. | Eg. |
| | 20 | 37 | | I. | Sh. | Eg |
| 5 | 14 | 18 | | II. | Tr. | In. |
| | 14 | 25 | | I. | Oc. | Dis. |
| | 14 | 57 | | III. | Tr. | In. |
| | 16 | 47 | | II. | Sh. | In. |
| | 16 | 56 | | II. | Tr. | Eg. |
| | 17 | 13 | | III. | Tr. | Eg. |
| | 17 | 48 | 17.7 | I. | Ec. | Re. |
| | 19 | 25 | | II. | Sh. | Eg. |
| | 19 | 57 | | III. | Sh. | In. |
| | 22 | 2 | | III. | Sh. | Eg. |
| 6 | 11 | 41 | | I. | Tr. | In. |
| | 12 | 53 | | I. | Sh. | In. |
| | 13 | 54 | | I. | Tr. | Eg. |
| | 15 | 6 | | I. | Sh. | Eg. |
| 7 | 8 | 54 | | I. | Oc. | Dis. |
| | 9 | 6 | | II. | Oc. | Dis. |
| | 12 | 16 | 59.7 | I. | Ec. | Re. |
| | 14 | 9 | 51.1 | II. | Ec. | Re. |
| 8 | 6 | 10 | | I. | Tr. | In. |
| | 7 | 22 | | I. | Sh. | In.* |
| | 8 | 24 | | I. | Tr. | Eg.* |
| | 9 | 35 | | I. | Sh. | Eg. |
| 9 | 3 | 24 | | I. | Oc. | Dis. |
| | 3 | 38 | | II. | Tr | In. |
| | 5 | 7 | | III. | Oc. | Dis. |
| | 6 | 4 | | II. | Sh. | In. |
| | 6 | 16 | | II. | Tr. | Eg. |
| | 6 | 45 | 39.8 | I. | Ec. | Re. |
| | 7 | 23 | | III. | Oc. | Re.* |
| | 8 | 42 | | II. | Sh. | Eg. |
| | 10 | 7 | 32.7 | III. | Ec. | Dis. |
| | 12 | 1 | 0.5 | III. | Ec. | Re. |
| 10 | 0 | 40 | | I. | Tr. | In. |
| | 1 | 51 | | I. | Sh. | In. |
| | 2 | 53 | | I. | Tr. | Eg. |
| | 4 | 4 | | I. | Sh. | Eg. |
| | 21 | 53 | | I. | Oc. | Dis. |
| 10 | 22 | 27 | | II. | Oc. | Dis. |
| 11 | 1 | 14 | 20.3 | I. | Ec. | Re. |
| | 3 | 28 | 8.9 | II. | Ec. | Re. |
| | 19 | 9 | | I. | Tr. | In. |
| | 20 | 20 | | I. | Sh. | In. |
| | 21 | 23 | | I. | Tr. | Eg. |
| | 22 | 33 | | I. | Sh. | Eg. |
| 12 | 16 | 22 | | I. | Oc. | Dis. |
| | 16 | 59 | | II. | Tr. | In. |
| | 19 | 9 | | III. | Tr. | In. |
| | 19 | 21 | | II. | Sh. | In. |
| | 19 | 37 | | II. | Tr. | Eg. |
| | 19 | 43 | 1.1 | I. | Ec. | Re. |
| | 21 | 26 | | III. | Tr. | Eg. |
| | 22 | 0 | | II. | Sh. | Eg. |
| | 23 | 56 | | III. | Sh. | In. |
| 13 | 2 | 3 | | III. | Sh. | Eg. |
| | 13 | 39 | | I. | Tr. | In. |
| | 14 | 49 | | I. | Sh. | In. |
| | 15 | 53 | | I. | Tr. | Eg. |
| | 17 | 2 | | I. | Sh. | Eg. |
| 14 | 10 | 52 | | I. | Oc. | Dis. |
| | 11 | 50 | | II. | Oc. | Dis. |
| | 14 | 11 | 43.1 | I. | Ec. | Re. |
| | 16 | 47 | 30.1 | II. | Ec. | Re. |
| 15 | 8 | 8 | | I. | Tr. | In.* |
| | 9 | 17 | | I. | Sh. | In. |
| | 10 | 23 | | I. | Tr. | Eg. |
| | 11 | 30 | | I. | Sh. | Eg. |
| 16 | 5 | 22 | | I. | Oc | Dis. |
| | 6 | 20 | | II. | Tr. | In. |
| | 8 | 39 | | II. | Sh. | In. |
| | 8 | 40 | 22.6 | I. | Ec. | Re. |
| | 8 | 58 | | II. | Tr. | Eg. |
| | 9 | 19 | | III. | Oc. | Dis. |
| | 11 | 17 | | II. | Sh. | Eg. |
| | 11 | 37 | | III. | Oc. | Re. |
| | 14 | 6 | 17.4 | III. | Ec. | Dis. |
| | 16 | 0 | 36.0 | III. | Ec. | Re. |
| 17 | 2 | 38 | | I. | Tr. | In. |
| | 3 | 46 | | I. | Sh. | In. |
| | 4 | 52 | | I. | Tr. | Eg. |
| | 5 | 59 | | I. | Sh. | Eg. |
| | 23 | 51 | | I. | Oc. | Dis. |
| 18 | 1 | 12 | | II. | Oc. | Dis. |
| | 3 | 9 | 2.8 | I. | Ec. | Re. |
| | 6 | 5 | 47.1 | II. | Ec. | Re. |
| | 21 | 8 | | I. | Tr. | In. |
| | 22 | 15 | | I. | Sh. | In. |
| | 23 | 22 | | I. | Tr. | Eg. |
| 19 | 0 | 28 | | I. | Sh. | Eg. |
| | 18 | 21 | | I. | Oc. | Dis. |
| | 19 | 41 | | II. | Tr. | In. |
| | 21 | 37 | 43.1 | I. | Ec. | Re. |
| | 21 | 56 | | II. | Sh. | In. |
| | 22 | 20 | | II. | Tr. | Eg. |
| | 23 | 24 | | III. | Tr. | In. |
| 20 | 0 | 34 | | II. | Sh. | Eg. |
| | 1 | 41 | | III. | Tr. | Eg. |
| | 3 | 55 | | III. | Sh. | In. |
| | 6 | 3 | | III. | Sh. | Eg. |
| | 15 | 38 | | I. | Tr. | In. |
| | 16 | 44 | | I. | Sh. | In. |
| 20 | 17 | 52 | | I. | Tr. | Eg. |
| | 18 | 57 | | I. | Sh. | Eg. |
| 21 | 12 | 51 | | I. | Oc. | Dis. |
| | 14 | 35 | | II. | Oc. | Dis. |
| | 16 | 6 | 25.0 | I. | Ec. | Re. |
| | 19 | 25 | 5.8 | II. | Ec. | Re. |
| 22 | 10 | 8 | | I. | Tr. | In. |
| | 11 | 13 | | I. | Sh | In. |
| | 12 | 22 | | I. | Tr. | Eg. |
| | 13 | 26 | | I. | Sh. | Eg. |
| 23 | 7 | 20 | | I. | Oc. | Dis.* |
| | 9 | 2 | | II. | Tr. | In. |
| | 10 | 35 | 4.2 | I. | Ec. | Re. |
| | 11 | 15 | | II. | Sh. | In. |
| | 11 | 41 | | II. | Tr. | Eg. |
| | 13 | 36 | | III. | Oc. | Dis. |
| | 13 | 54 | | II. | Sh. | Eg. |
| | 15 | 54 | | III. | Oc. | Re. |
| | 18 | 5 | 38.0 | III. | Ec. | Dis. |
| | 20 | 0 | 48.6 | III. | Ec. | Re. |
| 24 | 4 | 38 | | I. | Tr. | In. |
| | 5 | 42 | | I. | Sh. | In. |
| | 6 | 52 | | I. | Tr. | Eg.* |
| | 7 | 55 | | I. | Sh. | Eg.* |
| 25 | 1 | 50 | | I. | Oc. | Dis. |
| | 3 | 58 | | II. | Oc | Dis. |
| | 5 | 3 | 44.1 | I. | Ec. | Re. |
| | 8 | 43 | 19.9 | II. | Ec. | Re. |
| | 23 | 8 | | I. | Tr. | In. |
| 26 | 0 | 10 | | I. | Sh. | In. |
| | 1 | 22 | | I. | Tr. | Eg. |
| | 2 | 23 | | I. | Sh. | Eg |
| | 20 | 20 | | I. | Oc. | Dis. |
| | 22 | 25 | | II. | Tr. | In. |
| | 23 | 32 | 23.9 | I. | Ec. | Re. |
| 27 | 0 | 30 | | II. | Sh. | In. |
| | 1 | 4 | | II. | Tr. | Eg. |
| | 3 | 9 | | II. | Sh. | Eg. |
| | 3 | 41 | | III. | Tr. | In. |
| | 5 | 59 | | III. | Tr. | Eg. |
| | 7 | 54 | | III. | Sh. | In. |
| | 10 | 3 | | III. | Sh. | Eg. |
| | 17 | 38 | | I. | Tr. | In. |
| | 18 | 39 | | I. | Sh. | In. |
| | 19 | 52 | | I. | Tr. | Eg. |
| | 20 | 52 | | I. | Sh. | Eg. |
| 28 | 14 | 50 | | I. | Oc. | Dis. |
| | 17 | 22 | | II. | Oc. | Dis. |
| | 18 | 1 | 5.4 | I. | Ec. | Re. |
| | 22 | 2 | 33.8 | II. | Ec. | Re. |
| 29 | 12 | 8 | | I. | Tr. | In. |
| | 13 | 8 | | I. | Sh. | In. |
| | 14 | 22 | | I. | Tr. | Eg |
| | 15 | 21 | | I. | Sh. | Eg. |
| 30 | 9 | 19 | | I. | Oc. | Dis. |
| | 11 | 47 | | II. | Tr. | In. |
| | 12 | 29 | 44.0 | I. | Ec. | Re. |
| | 13 | 48 | | II. | Sh. | In. |
| | 14 | 26 | | II. | Tr. | Eg. |
| | 16 | 26 | | II. | Sh. | Eg. |
| | 17 | 54 | | III. | Oc. | Dis. |
| | 20 | 13 | | III. | Oc. | Re. |
| | 22 | 4 | 28.8 | III. | Ec. | Dis. |

In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; * Visible at Washington.

## WASHINGTON MEAN TIME.

### OCTOBER.

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 0 | 0 | 32.4 | III. | Ec. | Re. | **11** | 12 | 21 | | III. | Tr. | In. | **21** | 21 | 32 | | II. | Sh. | In. |
| | 6 | 38 | | I. | Tr. | In.* | | 14 | 41 | | III. | Tr. | Eg. | | 22 | 46 | | II. | Tr. | Eg. |
| | 7 | 37 | | I. | Sh. | In. | | 15 | 53 | | III. | Sh. | In. | **22** | 0 | 11 | | II. | Sh. | Eg. |
| | 8 | 52 | | I. | Tr. | Eg. | | 18 | 3 | | III. | Sh. | Eg. | | 7 | 0 | | III. | Oc. | Dis. |
| | 9 | 50 | | I. | Sh. | Eg. | | 21 | 39 | | I. | Tr. | In. | | 9 | 21 | | III. | Oc. | Re. |
| **2** | 3 | 49 | | I. | Oc. | Dis. | | 22 | 29 | | I. | Sh | In. | | 10 | 0 | 16.8 | III. | Ec. | Dis. |
| | 6 | 45 | | II. | Oc. | Dis.* | | 23 | 53 | | I. | Tr. | Eg. | | 11 | 59 | 5.8 | III. | Ec. | Re. |
| | 6 | 58 | 23.4 | I. | Ec. | Re.* | **12** | 0 | 43 | | I. | Sh. | Eg. | | 12 | 40 | | I. | Tr. | In. |
| | 11 | 20 | 45 4 | II. | Ec. | Re. | | 18 | 49 | | I. | Oc. | Dis. | | 13 | 22 | | I. | Sh. | In. |
| **3** | 1 | 8 | | I. | Tr. | In. | | 21 | 50 | 19.3 | I. | Ec. | Re. | | 14 | 53 | | I. | Tr. | Eg. |
| | 2 | 5 | | I. | Sh. | In. | | 22 | 58 | | II. | Oc. | Dis. | | 15 | 35 | | I. | Sh. | Eg. |
| | 3 | 22 | | I. | Tr. | Eg. | **13** | 3 | 17 | 5.7 | II. | Ec. | Re. | **23** | 9 | 50 | | I. | Oc. | Dis. |
| | 4 | 19 | | I. | Sh. | Eg. | | 16 | 9 | | I. | Tr. | In. | | 12 | 42 | 6.9 | I. | Ec. | Re. |
| | 22 | 19 | | I. | Oc. | Dis. | | 16 | 58 | | I. | Sh. | In. | | 15 | 11 | | II. | Oc. | Dis. |
| **4** | 1 | 9 | | II. | Tr. | In. | | 18 | 23 | | I. | Tr. | Eg. | | 19 | 12 | 8.4 | II. | Ec. | Re. |
| | 1 | 27 | 2.3 | I. | Ec. | Re. | | 19 | 12 | | I. | Sh. | Eg. | **24** | 7 | 10 | | I. | Tr. | In. |
| | 3 | 5 | | II. | Sh. | In. | **14** | 13 | 19 | | I. | Oc. | Dis. | | 7 | 50 | | I. | Sh. | In. |
| | 3 | 49 | | II. | Tr. | Eg. | | 16 | 18 | 56.3 | I. | Ec. | Re. | | 9 | 24 | | I. | Tr. | Eg. |
| | 5 | 44 | | II. | Sh. | Eg. | | 17 | 18 | | II. | Tr. | In. | | 10 | 4 | | I. | Sh. | Eg. |
| | 8 | 0 | | III. | Tr. | In. | | 18 | 57 | | II. | Sh. | In. | **25** | 4 | 20 | | I. | Oc. | Dis. |
| | 10 | 19 | | III. | Tr. | Eg. | | 19 | 58 | | II. | Tr. | Eg. | | 7 | 10 | 43.2 | I. | Ec. | Re. |
| | 11 | 53 | | III. | Sh. | In. | | 21 | 36 | | II. | Sh. | Eg. | | 9 | 29 | | II. | Tr. | In. |
| | 14 | 3 | | III. | Sh. | Eg. | **15** | 2 | 36 | | III. | Oc. | Dis. | | 10 | 49 | | II. | Sh. | In. |
| | 19 | 38 | | I. | Tr. | In. | | 4 | 56 | | III. | Oc. | Re. | | 12 | 10 | | II. | Tr. | Eg. |
| | 20 | 34 | | I. | Sh. | In. | | 6 | 1 | 59.5 | III. | Ec. | Dis. | | 13 | 29 | | II. | Sh. | Eg. |
| | 21 | 52 | | I. | Tr. | Eg. | | 7 | 59 | 52.5 | III. | Ec. | Re. | | 21 | 11 | | III. | Tr. | In. |
| | 22 | 48 | | I. | Sh. | Eg. | | 10 | 39 | | I. | Tr. | In. | | 23 | 31 | | III. | Tr. | Eg. |
| **5** | 16 | 49 | | I. | Oc. | Dis. | | 11 | 27 | | I. | Sh. | In. | | 23 | 51 | | III. | Sh. | In.* |
| | 19 | 55 | 43.6 | I. | Ec. | Re. | | 12 | 53 | | I. | Tr. | Eg. | **26** | 1 | 40 | | I. | Tr. | In. |
| | 20 | 10 | | II. | Oc. | Dis. | | 13 | 40 | | I. | Sh. | Eg. | | 2 | 3 | | III. | Sh. | Eg. |
| **6** | 0 | 39 | 54.2 | II. | Ec. | Re. | **16** | 7 | 49 | | I. | Oc. | Dis. | | 2 | 19 | | I. | Sh. | In. |
| | 14 | 8 | | I. | Tr. | In. | | 10 | 47 | 35.0 | I. | Ec. | Re. | | 3 | 54 | | I. | Tr. | Eg. |
| | 15 | 2 | | I. | Sh. | In. | | 12 | 22 | | II. | Oc. | Dis. | | 4 | 33 | | I. | Sh. | Eg |
| | 16 | 22 | | I. | Tr. | Eg. | | 16 | 35 | 10.9 | II. | Ec. | Re. | | 22 | 50 | | I. | Oc. | Dis. |
| | 17 | 17 | | I. | Sh. | Eg. | **17** | 5 | 9 | | I. | Tr. | In. | **27** | 1 | 39 | 23.1 | I. | Ec. | Re. |
| **7** | 11 | 19 | | I. | Oc. | Dis. | | 5 | 56 | | I. | Sh. | In. | | 4 | 37 | | II. | Oc. | Dis. |
| | 14 | 24 | 21.4 | I. | Ec. | Re. | | 7 | 23 | | I. | Tr. | Eg. | | 8 | 30 | 57.2 | II. | Ec. | Re. |
| | 14 | 32 | | II. | Tr. | In. | | 8 | 9 | | I. | Sh. | Eg. | | 20 | 10 | | I. | Tr. | In. |
| | 16 | 22 | | II. | Sh. | In. | **18** | 2 | 20 | | I. | Oc. | Dis. | | 20 | 48 | | I. | Sh. | In. |
| | 17 | 12 | | II. | Tr. | Eg. | | 5 | 16 | 12.2 | I. | Ec. | Re. | | 22 | 24 | | I. | Tr. | Eg. |
| | 19 | 0 | | II. | Sh. | Eg. | | 6 | 42 | | II. | Tr. | In. | | 23 | 2 | | I. | Sh. | Eg. |
| | 22 | 15 | | III. | Oc. | Dis. | | 8 | 15 | | II. | Sh. | In. | **28** | 17 | 20 | | I. | Oc. | Dis. |
| **8** | 0 | 34 | | III. | Oc. | Re. | | 9 | 22 | | II. | Tr. | Eg. | | 20 | 7 | 58.8 | I. | Ec. | Re. |
| | 2 | 3 | 32.3 | III. | Ec. | Dis. | | 10 | 54 | | II. | Sh. | Eg. | | 22 | 53 | | II. | Tr. | In. |
| | 4 | 0 | 30.1 | III. | Ec. | Re. | | 16 | 46 | | III. | Tr. | In. | **29** | 0 | 7 | | II. | Sh. | In. |
| | 8 | 38 | | I. | Tr. | In. | | 19 | 6 | | III. | Tr. | Eg. | | 1 | 34 | | II. | Tr. | Eg. |
| | 9 | 31 | | I. | Sh. | In. | | 19 | 52 | | III. | Sh. | In. | | 2 | 46 | | II. | Sh. | Eg. |
| | 10 | 52 | | I. | Tr. | Eg. | | 22 | 3 | | III. | Sh. | Eg. | | 11 | 25 | | III. | Oc. | Dis. |
| | 11 | 46 | | I. | Sh. | Eg. | | 23 | 40 | | I. | Tr. | In. | | 13 | 46 | | III. | Oc. | Re. |
| **9** | 5 | 49 | | I. | Oc. | Dis. | **19** | 0 | 25 | | I. | Sh. | In. | | 13 | 59 | 38.6 | III. | Ec. | Dis. |
| | 8 | 53 | 0.5 | I. | Ec. | Re. | | 1 | 53 | | I. | Tr. | Eg. | | 14 | 41 | | I. | Tr | In. |
| | 9 | 33 | | II. | Oc. | Dis. | | 2 | 37 | | I. | Sh. | Eg. | | 15 | 17 | | I. | Sh. | In. |
| | 13 | 58 | 2.9 | II. | Ec. | Re. | | 20 | 50 | | I. | Oc. | Dis. | | 15 | 58 | 24.6 | III. | Ec. | Re. |
| **10** | 3 | 8 | | I. | Tr. | In. | | 23 | 44 | 52.5 | I. | Ec. | Re. | | 16 | 55 | | I. | Tr. | Eg. |
| | 4 | 0 | | I. | Sh. | In. | **20** | 1 | 47 | | II. | Oc. | Dis. | | 17 | 30 | | I. | Sh. | Eg. |
| | 5 | 22 | | I. | Tr. | Eg. | | 5 | 54 | 7.2 | II. | Ec. | Re. | **30** | 11 | 51 | | I. | Oc. | Dis. |
| | 6 | 14 | | I. | Sh. | Eg. | | 18 | 10 | | I. | Tr. | In. | | 14 | 36 | 36.2 | I. | Ec. | Re. |
| **11** | 0 | 19 | | I. | Oc. | Dis. | | 18 | 53 | | I. | Sh. | In. | | 18 | 1 | | II. | Oc. | Dis. |
| | 3 | 21 | 38.5 | I. | Ec. | Re. | | 20 | 23 | | I. | Tr. | Eg. | | 21 | 48 | 54.7 | II. | Ec. | Re. |
| | 3 | 55 | | II. | Tr. | In. | | 21 | 6 | | I. | Sh. | Eg. | **31** | 9 | 11 | | I. | Tr. | In. |
| | 5 | 40 | | II. | Sh. | In. | **21** | 15 | 20 | | I. | Oc. | Dis. | | 9 | 46 | | I. | Sh. | In. |
| | 6 | 35 | | II. | Tr. | Eg.* | | 18 | 13 | 28.9 | I. | Ec. | Re. | | 11 | 25 | | I. | Tr. | Eg. |
| | 8 | 19 | | II. | Sh. | Eg. | | 20 | 5 | | II. | Tr. | In. | | 11 | 59 | | I. | Sh. | Eg. |

**NOTE.**—For Phases of Eclipses see pages 462 and 463. * Visible at Washington.
Ec., denotes eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow

## WASHINGTON MEAN TIME.

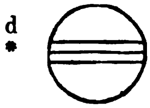
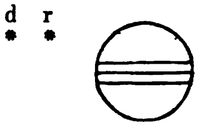
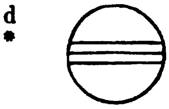
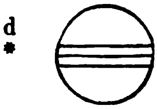
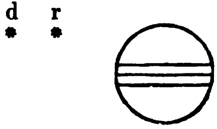
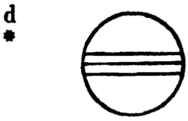
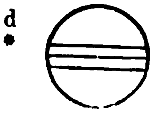
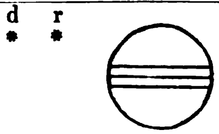
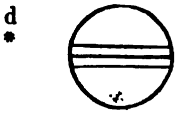
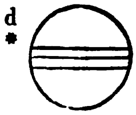
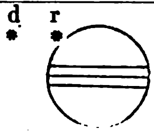
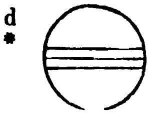
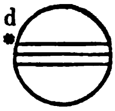
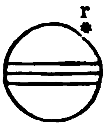
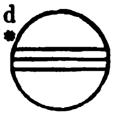
### NOVEMBER.

| d | h | m | s | | | | d | h | m | s | | | | d | h | m | s | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6 | 21 | | I. | Ec. | Dis. | 2 | 3 | 50 | | III. | Sh. | In. | 3 | 3 | 33 | 50.8 | I. | Ec. | Re. |
| | 9 | 5 | 11.5 | I. | Oc. | Re. | | 3 | 57 | | III. | Tr. | Eg. | | 7 | 27 | | II. | Oc. | Dis. |
| | 12 | 18 | | II. | Tr. | In. | | 4 | 14 | | I. | Sh. | In. | | 11 | 7 | 35.7 | II. | Ec. | Re. |
| | 13 | 24 | | II. | Sh. | In. | | 5 | 56 | | I. | Tr. | Eg. | | 22 | 12 | | I. | Tr. | In. |
| | 14 | 58 | | II. | Tr. | Eg. | | 6 | 3 | | III. | Sh. | Eg. | | 22 | 43 | | I. | Sh. | In. |
| | 16 | 4 | | II. | Sh. | Eg. | | 6 | 28 | | I. | Sh. | Eg. | 4 | 0 | 26 | | I. | Tr. | Eg. |
| 2 | 1 | 37 | | III. | Tr. | In. | 3 | 0 | 51 | | I. | Oc. | Dis. | | 0 | 56 | | I. | Sh. | Eg. |
| | 3 | 42 | | I. | Tr. | In. | | | | | | | | | | | | | | |

**The Satellites are not visible after November 4th, Jupiter being too near the Sun.**

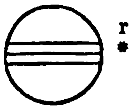
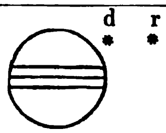
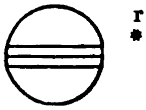
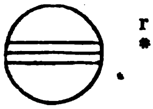
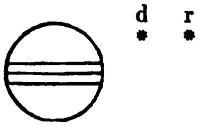
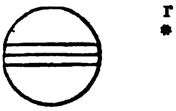
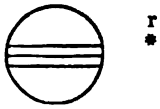
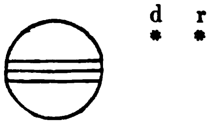
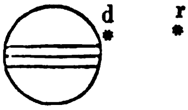
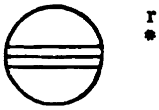
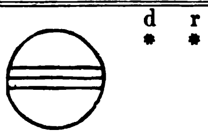
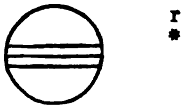
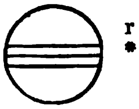
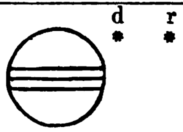
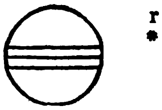
In., denotes ingress; Eg., egress: Dis., disappearance; Re., reappearance; * Visible at Washington.

## Phases of the Eclipses of the Satellites for an Inverting Telescope.

| | | | | |
|---|---|---|---|---|
| **January.** | I. |  | III. |  |
| | II. |  | IV. | Not Eclipsed. |
| **February.** | I. |  | III. |  |
| | II. |  | IV. | Not Eclipsed. |
| **March.** | I. |  | III. |  |
| | II. |  | IV. | Not Eclipsed. |
| **April.** | I. |  | III. |  |
| | II. |  | IV. | Not Eclipsed. |
| **May.** | I. |  | III. |  |
| | II. |  | IV. | Not Eclipsed. |

**Note.**—Each diagram is given for the eclipse which occurs nearest the middle of the month.

### Phases of the Eclipses of the Satellites for an Inverting Telescope.

| | | | |
|---|---|---|---|
| **June.**<br>I. |  | III. |  |
| II. |  | IV. | Not Eclipsed. |
| **July.**<br>I. |  | III. |  |
| II. |  | IV. | Not Eclipsed. |
| **August.**<br>I. |  | III. |  |
| II. |  | IV. | Not Eclipsed. |
| **September.**<br>I. |  | III. |  |
| II. |  | IV. | Not Eclipsed. |
| **October.**<br>I. |  | III. |  |
| II. |  | IV. | Not Eclipsed. |

**NOTE.**—Each diagram is given for the eclipse which occurs nearest the middle of the month.

## WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

### SATELLITE I.

| | | h | m | | | h | m | | | h | m | | | h | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. | 1 | 23 | 7.9 | Mar. | 19 | 20 | 8.2 | June | 5 | 15 | 26.4 | Aug. | 22 | 11 | 38.2 |
| | 3 | 17 | 37.5 | | 21 | 14 | 35.4 | | 7 | 9 | 52.6 | | 24 | 6 | 7.2 |
| | 5 | 12 | 7.3 | | 23 | 9 | 2.7 | | 9 | 4 | 18.9 | | 26 | 0 | 36.2 |
| | 7 | 6 | 36.9 | | 25 | 3 | 29.7 | | 10 | 22 | 45.2 | | 27 | 19 | 5.3 |
| | 9 | 1 | 6.5 | | 26 | 21 | 56.8 | | 12 | 17 | 11.5 | | 29 | 13 | 34.5 |
| | 10 | 19 | 36.0 | | 28 | 16 | 23.7 | | 14 | 11 | 37.9 | | 31 | 8 | 3.6 |
| | 12 | 14 | 5.5 | | 30 | 10 | 50.7 | | 16 | 6 | 4.4 | Sept. | 2 | 2 | 32.8 |
| | 14 | 8 | 35.0 | April | 1 | 5 | 17.5 | | 18 | 0 | 30.9 | | 3 | 21 | 2.1 |
| | 16 | 3 | 4.4 | | 2 | 23 | 44.4 | | 19 | 18 | 57.6 | | 5 | 15 | 31.5 |
| | 17 | 21 | 33.7 | | 4 | 18 | 11.1 | | 21 | 13 | 24.3 | | 7 | 10 | 0.9 |
| | 19 | 16 | 3.2 | | 6 | 12 | 37.9 | | 23 | 7 | 51.0 | | 9 | 4 | 30.2 |
| | 21 | 10 | 32.4 | | 8 | 7 | 4.6 | | 25 | 2 | 17.7 | | 10 | 22 | 59.7 |
| | 23 | 5 | 1.8 | | 10 | 1 | 31.2 | | 26 | 20 | 44.6 | | 12 | 17 | 29.0 |
| | 24 | 23 | 30.9 | | 11 | 19 | 57.7 | | 28 | 15 | 11.4 | | 14 | 11 | 58.7 |
| | 26 | 18 | 0.1 | | 13 | 14 | 24.1 | | 30 | 9 | 38.3 | | 16 | 6 | 28.3 |
| | 28 | 12 | 29.2 | | 15 | 8 | 50.4 | July | 2 | 4 | 4.3 | | 18 | 0 | 58.0 |
| | 30 | 6 | 58.3 | | 17 | 3 | 16.8 | | 3 | 22 | 32.4 | | 19 | 19 | 27.6 |
| Feb. | 1 | 1 | 27.3 | | 18 | 21 | 43.1 | | 5 | 16 | 59.5 | | 21 | 13 | 57.3 |
| | 2 | 19 | 56.3 | | 20 | 16 | 9.3 | | 7 | 11 | 26.8 | | 23 | 8 | 26.9 |
| | 4 | 14 | 25.2 | | 22 | 10 | 35.5 | | 9 | 5 | 54.1 | | 25 | 2 | 56.7 |
| | 6 | 8 | 54.1 | | 24 | 5 | 1.7 | | 11 | 0 | 21.5 | | 26 | 21 | 26.5 |
| | 8 | 3 | 22.8 | | 25 | 23 | 27.8 | | 12 | 18 | 49.0 | | 28 | 15 | 56.3 |
| | 9 | 21 | 51.6 | | 27 | 17 | 53.9 | | 14 | 13 | 16.5 | | 30 | 10 | 26.2 |
| | 11 | 16 | 20.2 | | 29 | 12 | 19.9 | | 16 | 7 | 44.1 | Oct. | 2 | 4 | 56.1 |
| | 13 | 10 | 49.0 | May | 1 | 6 | 46.0 | | 18 | 2 | 11.7 | | 3 | 23 | 26.1 |
| | 15 | 5 | 17.5 | | 3 | 1 | 12.0 | | 19 | 20 | 39.4 | | 5 | 17 | 56.0 |
| | 16 | 23 | 46.0 | | 4 | 19 | 38.1 | | 21 | 15 | 7.1 | | 7 | 12 | 26.1 |
| | 18 | 18 | 14.4 | | 6 | 14 | 4.1 | | 23 | 9 | 35.0 | | 9 | 6 | 56.1 |
| | 20 | 12 | 42.9 | | 8 | 8 | 30.1 | | 25 | 4 | 2.9 | | 11 | 1 | 26.1 |
| | 22 | 7 | 11.2 | | 10 | 2 | 56.0 | | 26 | 22 | 30.9 | | 12 | 19 | 56.2 |
| | 24 | 1 | 39.5 | | 11 | 21 | 22.0 | | 28 | 16 | 58.9 | | 14 | 14 | 26.2 |
| | 25 | 20 | 7.7 | | 13 | 15 | 48.0 | | 30 | 11 | 26.8 | | 16 | 8 | 56.3 |
| | 27 | 14 | 35.9 | | 15 | 10 | 14.0 | Aug. | 1 | 5 | 55.2 | | 18 | 3 | 26.4 |
| | 29 | 9 | 3.9 | | 17 | 4 | 39.8 | | 3 | 0 | 23.5 | | 19 | 21 | 56.6 |
| Mar. | 2 | 3 | 31.9 | | 18 | 23 | 5.8 | | 4 | 18 | 51.8 | | 21 | 16 | 26.7 |
| | 3 | 21 | 59.8 | | 20 | 17 | 31.7 | | 6 | 13 | 20.1 | | 23 | 10 | 56.8 |
| | 5 | 16 | 27.8 | | 22 | 11 | 57.6 | | 8 | 7 | 48.5 | | 25 | 5 | 27.0 |
| | 7 | 10 | 55.4 | | 24 | 6 | 23.6 | | 10 | 2 | 17.0 | | 26 | 23 | 57.2 |
| | 9 | 5 | 23.1 | | 26 | 0 | 49.7 | | 11 | 20 | 45.6 | | 28 | 18 | 27.4 |
| | 10 | 23 | 50.8 | | 27 | 19 | 15.7 | | 13 | 15 | 14.2 | | 30 | 12 | 57.7 |
| | 12 | 18 | 19.3 | | 29 | 13 | 41.8 | | 15 | 9 | 42.9 | Nov. | 1 | 7 | 28.0 |
| | 14 | 12 | 46.0 | | 31 | 8 | 7.9 | | 17 | 4 | 11.7 | | 3 | 1 | 58.4 |
| | 16 | 7 | 13.5 | June | 2 | 2 | 34.1 | | 18 | 22 | 40.4 | | 4 | 20 | 28.6 |
| | 18 | 1 | 40.8 | | 3 | 21 | 0.3 | | 20 | 17 | 9.3 | | | | |

### SATELLITE II.

| | | h | m | | | h | m | | | h | m | | | h | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. | 2 | 20 | 11.3 | Jan. | 24 | 4 | 15.7 | Feb. | 14 | 12 | 6.8 | Mar. | 6 | 19 | 42.2 |
| | 6 | 9 | 32.7 | | 27 | 17 | 35.2 | | 18 | 1 | 24.0 | | 10 | 8 | 56.4 |
| | 9 | 22 | 53.9 | | 31 | 6 | 54.3 | | 21 | 14 | 40.6 | | 13 | 22 | 10.0 |
| | 13 | 12 | 14.7 | Feb. | 3 | 20 | 13.0 | | 25 | 3 | 56.8 | | 17 | 11 | 23.2 |
| | 17 | 1 | 35.4 | | 7 | 9 | 31.3 | | 28 | 17 | 12.4 | | 21 | 0 | 35.9 |
| | 20 | 14 | 55.7 | | 10 | 22 | 49.2 | Mar. | 3 | 6 | 27.6 | | 24 | 13 | 47.9 |

## WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

### SATELLITE II.

| | | h m | | | h m | | | h m | | | h m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar. | 28 | 2 59.6 | May | 23 | 21 16.3 | July | 19 | 16 5.4 | Sept. | 14 | 13 9.2 |
| | 31 | 16 10.6 | | 27 | 10 23.7 | | 23 | 5 19.8 | | 18 | 2 31.3 |
| April | 4 | 5 21.1 | | 30 | 23 31.8 | | 26 | 18 36.0 | | 21 | 15 54.7 |
| | 7 | 18 31.2 | June | 3 | 12 39.5 | | 30 | 7 51.6 | | 25 | 5 17.5 |
| | 11 | 7 41.0 | | 7 | 1 48.2 | Aug. | 2 | 21 9.1 | | 28 | 18 41.5 |
| | 14 | 20 50.2 | | 10 | 14 56.6 | | 6 | 10 26.0 | Oct. | 2 | 8 4.8 |
| | 18 | 9 59.3 | | 14 | 4 6.0 | | 9 | 23 44.5 | | 5 | 21 29.3 |
| | 21 | 23 7.7 | | 17 | 17 15.0 | | 13 | 13 2.3 | | 9 | 10 53.0 |
| | 25 | 12 16.0 | | 21 | 6 25.5 | | 17 | 2 21.8 | | 13 | 0 17.8 |
| | 29 | 1 23.7 | | 24 | 19 35.6 | | 20 | 15 40.7 | | 16 | 13 41.8 |
| May | 2 | 14 31.6 | | 28 | 8 47.2 | | 24 | 5 1.1 | | 20 | 3 7.0 |
| | 6 | 3 38.8 | July | 1 | 21 58.4 | | 27 | 18 20.9 | | 23 | 16 31.4 |
| | 9 | 16 46.5 | | 5 | 11 10.8 | | 31 | 7 42.3 | | 27 | 5 56.8 |
| | 13 | 5 53.6 | | 9 | 0 23.2 | Sept. | 3 | 21 2.9 | | 30 | 19 21.5 |
| | 16 | 19 1.2 | | 12 | 13 37.0 | | 7 | 10 25.0 | Nov. | 3 | 8 47.1 |
| | 20 | 8 8.4 | | 16 | 2 50.4 | | 10 | 23 46.3 | | | |

### SATELLITE III.

| | | h m | | | h m | | | h m | | | h m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. | 2 | 19 44.1 | Mar. | 21 | 15 59.6 | June | 8 | 5 8.8 | Aug. | 25 | 21 58.6 |
| | 10 | 0 1.8 | | 28 | 19 36.1 | | 15 | 8 31.8 | Sept. | 2 | 2 5.2 |
| | 17 | 4 17.5 | April | 4 | 23 8.1 | | 22 | 11 57.5 | | 9 | 6 15.3 |
| | 24 | 8 29.8 | | 12 | 2 36.1 | | 29 | 15 26.8 | | 16 | 10 28.0 |
| | 31 | 12 40.4 | | 19 | 6 0.3 | July | 6 | 19 0.0 | | 23 | 14 44.8 |
| Feb. | 7 | 16 46.5 | | 26 | 9 22.3 | | 13 | 22 38.7 | | 30 | 19 3.4 |
| | 14 | 20 48.7 | May | 3 | 12 41.2 | | 21 | 2 21.0 | Oct. | 7 | 23 24.1 |
| | 22 | 0 47.2 | | 10 | 15 58.9 | | 28 | 6 7.8 | | 15 | 3 46.3 |
| | 29 | 4 41.6 | | 17 | 19 15.2 | Aug. | 4 | 9 59.9 | | 22 | 8 10.6 |
| Mar. | 7 | 8 32.2 | | 24 | 22 31.7 | | 11 | 13 55.5 | | 29 | 12 35.3 |
| | 14 | 12 18.0 | June | 1 | 1 49.3 | | 18 | 17 55.4 | Nov. | 5 | 17 1.6 |

In the following Tables $x$ and $y$ are the rectangular coördinates for each Satellite, referred to the centre of the primary and the major and minor axes of the apparent ellipse described by the Satellite. $x$ is positive on the *east* side of the planet; negative on the *west* side. $y$ is positive when *north;* negative when *south.*

$x'$ and $y'$ are the coördinates which correspond to a constant value of the major axis and maximum value of the minor axis, as seen from the sun at its mean distance.

The factors by which $x'$ and $y'$ must be multiplied to obtain the coöordinates $x$ and $y$ at any time, are given for each Satellite on pages 470–471.

$p$ is the inclination of the minor axis of the apparent ellipse to the circle of declination; reckoned from the *north,* + towards the *east.*

## COÖRDINATES IN THE MEAN APPARENT ELLIPSE DESCRIBED BY THE SATELLITE, AND FOR THE MEAN DISTANCE OF JUPITER FROM THE SUN, FOR THE TIME (*t*) AFTER GEOCENTRIC SUPERIOR CONJUNCTION.

### SATELLITE I.

| *t* | *x′* | *y′* | *t* | *x′* | *y′* | *t* | *x′* | *y′* |
|---|---|---|---|---|---|---|---|---|
| d h m | | | d h m | | | d h m | | |
| 0 0 0 | + 0″.0 | + 6″.6 | 0 15 0 | + 87″.1 | − 4″.0 | 1 6 0 | −105″.1 | − 1″.8 |
| 0 0 20 | 5.4 | 6.6 | 0 15 20 | 83.7 | 4.3 | 1 6 20 | 106.4 | 1.5 |
| 0 0 40 | 10.8 | 6.6 | 0 15 40 | 80.1 | 4.5 | 1 6 40 | 107.5 | 1.2 |
| 0 1 0 | 16.1 | 6.6 | 0 16 0 | 76.4 | 4.7 | 1 7 0 | 108.3 | 0.8 |
| 0 1 20 | 21.4 | 6.5 | 0 16 20 | 72.5 | 5.0 | 1 7 20 | 108.8 | 0.5 |
| 0 1 40 | 26.6 | 6.4 | 0 16 40 | 68.4 | 5.2 | 1 7 40 | 109.1 | − 0.2 |
| 0 2 0 | + 31.8 | + 6.3 | 0 17 0 | + 64.1 | − 5.4 | 1 8 0 | −109.1 | + 0.1 |
| 0 2 20 | 36.9 | 6.2 | 0 17 20 | 59.6 | 5.5 | 1 8 20 | 108.9 | 0.5 |
| 0 2 40 | 42.0 | 6.1 | 0 17 40 | 55.0 | 5.7 | 1 8 40 | 108.4 | 0.8 |
| 0 3 0 | 46.9 | 6.0 | 0 18 0 | 50.3 | 5.9 | 1 9 0 | 107.6 | 1.1 |
| 0 3 20 | 51.7 | 5.8 | 0 18 20 | 45.5 | 6.0 | 1 9 20 | 106.6 | 1.4 |
| 0 3 40 | 56.4 | 5.7 | 0 18 40 | 40.5 | 6.1 | 1 9 40 | 105.3 | 1.8 |
| 0 4 0 | + 60.9 | + 5.5 | 0 19 0 | + 35.5 | − 6.3 | 1 10 0 | −103.8 | + 2.1 |
| 0 4 20 | 65.3 | 5.3 | 0 19 20 | 30.4 | 6.4 | 1 10 20 | 102.0 | 2.4 |
| 0 4 40 | 69.5 | 5.1 | 0 19 40 | 25.2 | 6.4 | 1 10 40 | 99.9 | 2.7 |
| 0 5 0 | 73.6 | 4.9 | 0 20 0 | 19.9 | 6.5 | 1 11 0 | 97.6 | 3.0 |
| 0 5 20 | 77.5 | 4.7 | 0 20 20 | 14.6 | 6.6 | 1 11 20 | 95.1 | 3.3 |
| 0 5 40 | 81.2 | 4.4 | 0 20 40 | 9.2 | 6.6 | 1 11 40 | 92.3 | 3.5 |
| 0 6 0 | + 84.7 | + 4.2 | 0 21 0 | + 3.8 | − 6.6 | 1 12 0 | − 89.3 | + 3.8 |
| 0 6 20 | 88.0 | 3.9 | 0 21 20 | − 1 5 | 6.6 | 1 12 20 | 86.1 | 4.1 |
| 0 6 40 | 91.1 | 3.7 | 0 21 40 | 6.9 | 6.6 | 1 12 40 | 82.7 | 4.3 |
| 0 7 0 | 94.0 | 3.4 | 0 22 0 | 12.3 | 6.6 | 1 13 0 | 79.1 | 4.6 |
| 0 7 20 | 96.6 | 3.1 | 0 22 20 | 17.6 | 6.5 | 1 13 20 | 75.3 | 4.8 |
| 0 7 40 | 99.0 | 2.8 | 0 22 40 | 22.9 | 6.5 | 1 13 40 | 71.3 | 5.0 |
| 0 8 0 | +101.1 | + 2.5 | 0 23 0 | − 28.1 | − 6.4 | 1 14 0 | − 67.1 | + 5.2 |
| 0 8 20 | 103.0 | 2.2 | 0 23 20 | 33.3 | 6.3 | 1 14 20 | 62.8 | 5.4 |
| 0 8 40 | 104.7 | 1.9 | 0 23 40 | 38.4 | 6.2 | 1 14 40 | 58.3 | 5.6 |
| 0 9 0 | 106.1 | 1.6 | 1 0 0 | 43.4 | 6.1 | 1 15 0 | 53.7 | 5.8 |
| 0 9 20 | 107.3 | 1.3 | 1 0 20 | 48.3 | 5.9 | 1 15 20 | 49.0 | 5.9 |
| 0 9 40 | 108.1 | 0.9 | 1 0 40 | 53.1 | 5.8 | 1 15 40 | 44.1 | 6.1 |
| 0 10 0 | +108.7 | + 0.6 | 1 1 0 | − 57.7 | − 5.6 | 1 16 0 | − 39.1 | + 6.2 |
| 0 10 20 | 109.1 | + 0.3 | 1 1 20 | 62.2 | 5.4 | 1 16 20 | 34.0 | 6.3 |
| 0 10 40 | 109.1 | − 0.1 | 1 1 40 | 66.6 | 5.2 | 1 16 40 | 28.9 | 6.4 |
| 0 11 0 | 109.0 | 0.4 | 1 2 0 | 70.8 | 5.0 | 1 17 0 | 23.7 | 6.5 |
| 0 11 20 | 108.6 | 0.7 | 1 2 20 | 74.8 | 4.8 | 1 17 20 | 18.4 | 6.5 |
| 0 11 40 | 107.9 | 1.0 | 1 2 40 | 78.6 | 4.6 | 1 17 40 | 13.0 | 6.6 |
| 0 12 0 | +106.9 | − 1.3 | 1 3 0 | − 82.2 | − 4.4 | 1 18 0 | − 7.7 | + 6.6 |
| 0 12 20 | 105.7 | 1.7 | 1 3 20 | 85.6 | 4.1 | 1 18 20 | − 2.3 | 6.6 |
| 0 12 40 | 104.2 | 2.0 | 1 3 40 | 88.9 | 3.8 | 1 18 40 | + 3.1 | 6.6 |
| 0 13 0 | 102.5 | 2.3 | 1 4 0 | 91.9 | 3.6 | 1 19 0 | 8.5 | 6.6 |
| 0 13 20 | 100.5 | 2.6 | 1 4 20 | 94.7 | 3.3 | 1 19 20 | 13.8 | 6.6 |
| 0 13 40 | 98.3 | 2.9 | 1 4 40 | 97.3 | 3.0 | 1 19 40 | 19.1 | 6.5 |
| 0 14 0 | + 95.8 | − 3.2 | 1 5 0 | − 99.6 | − 2.7 | 1 20 0 | + 24.4 | + 6.5 |
| 0 14 20 | 93.1 | 3.5 | 1 5 20 | 101.7 | 2.4 | | | |
| 0 14 40 | + 90.2 | − 3.7 | 1 5 40 | −103.5 | − 2.1 | | | |

## COÖRDINATES IN THE MEAN APPARENT ELLIPSE.

### SATELLITE II.

| *t* | *x′* | *y′* | *t* | *x′* | *y′* | *t* | *x′* | *y′* |
|---|---|---|---|---|---|---|---|---|
| d h m | ″ | ″ | d h m | ″ | ″ | d h m | ″ | ″ |
| 0 0 0 | + 0.0 | +12.2 | 1 6 0 | +139.5 | − 7.3 | 2 12 0 | −166.4 | − 3.5 |
| 0 0 40 | 8.5 | 12.2 | 1 6 40 | 134.2 | 7.7 | 2 12 40 | 168.6 | 2.9 |
| 0 1 20 | 17.0 | 12.1 | 1 7 20 | 128.6 | 8.2 | 2 13 20 | 170.4 | 2.3 |
| 0 2 0 | 25.5 | 12.1 | 1 8 0 | 122.7 | 8.6 | 2 14 0 | 171.9 | 1.8 |
| 0 2 40 | 33.9 | 12.0 | 1 8 40 | 116.5 | 9.0 | 2 14 40 | 173.0 | 1.2 |
| 0 3 20 | 42.2 | 11.8 | 1 9 20 | 110.1 | 9.4 | 2 15 20 | 173.6 | − 0.6 |
| 0 4 0 | + 50.5 | +11.7 | 1 10 0 | +103.4 | − 9.8 | 2 16 0 | −173.8 | 0.0 |
| 0 4 40 | 58.6 | 11.5 | 1 10 40 | 96.4 | 10.1 | 2 16 40 | 173.6 | + 0.6 |
| 0 5 20 | 66.5 | 11.3 | 1 11 20 | 89.2 | 10.5 | 2 17 20 | 172.9 | 1.2 |
| 0 6 0 | 74.3 | 11.0 | 1 12 0 | 81.7 | 10.8 | 2 18 0 | 171.8 | 1.8 |
| 0 6 40 | 81.9 | 10.8 | 1 12 40 | 74.1 | 11.0 | 2 18 40 | 170.3 | 2.4 |
| 0 7 20 | 89.4 | 10.5 | 1 13 20 | 66.3 | 11.3 | 2 19 20 | 168.4 | 3.0 |
| 0 8 0 | + 96.6 | +10.1 | 1 14 0 | + 58.3 | −11.5 | 2 20 0 | −166.2 | + 3.5 |
| 0 8 40 | 103.6 | 9.8 | 1 14 40 | 50.2 | 11.7 | 2 20 40 | 163.5 | 4.1 |
| 0 9 20 | 110.3 | 9.4 | 1 15 20 | 42.0 | 11.8 | 2 21 20 | 160.4 | 4.7 |
| 0 10 0 | 116.7 | 9.0 | 1 16 0 | 33.7 | 12.0 | 2 22 0 | 156.9 | 5.2 |
| 0 10 40 | 122.9 | 8.6 | 1 16 40 | 25.3 | 12.1 | 2 22 40 | 153.0 | 5.8 |
| 0 11 20 | 128.8 | 8.2 | 1 17 20 | 16.8 | 12.1 | 2 23 20 | 148.8 | 6.3 |
| 0 12 0 | +134.4 | + 7.7 | 1 18 0 | + 8.3 | −12.2 | 3 0 0 | −144.2 | + 6.8 |
| 0 12 40 | 139.6 | 7.3 | 1 18 40 | − 0.2 | 12.2 | 3 0 40 | 139.3 | 7.3 |
| 0 13 20 | 144.5 | 6.8 | 1 19 20 | 8.8 | 12.2 | 3 1 20 | 134.1 | 7.8 |
| 0 14 0 | 149.0 | 6.3 | 1 20 0 | 17.3 | 12.1 | 3 2 0 | 128.5 | 8.2 |
| 0 14 40 | 153.2 | 5.7 | 1 20 40 | 25.7 | 12.1 | 3 2 40 | 122.6 | 8.6 |
| 0 15 20 | 157.0 | 5.2 | 1 21 20 | 34.1 | 12.0 | 3 3 20 | 116.4 | 9.0 |
| 0 16 0 | +160.5 | + 4.7 | 1 22 0 | − 42.4 | −11.8 | 3 4 0 | −109.9 | + 9.4 |
| 0 16 40 | 163.6 | 4.1 | 1 22 40 | 50.6 | 11.7 | 3 4 40 | 103.1 | 9.8 |
| 0 17 20 | 166.3 | 3.5 | 1 23 20 | 58.7 | 11.5 | 3 5 20 | 96.1 | 10.1 |
| 0 18 0 | 168.6 | 3.0 | 2 0 0 | 66.7 | 11.3 | 3 6 0 | 88.9 | 10.5 |
| 0 18 40 | 170.5 | 2.4 | 2 0 40 | 74.5 | 11.0 | 3 6 40 | 81.5 | 10.8 |
| 0 19 20 | 171.9 | 1.8 | 2 1 20 | 82.1 | 10.7 | 3 7 20 | 73.9 | 11.0 |
| 0 20 0 | +172.9 | + 1.2 | 2 2 0 | − 89.5 | −10.4 | 3 8 0 | − 66.1 | +11.3 |
| 0 20 40 | 173.6 | + 0.6 | 2 2 40 | 96.7 | 10.1 | 3 8 40 | 58.1 | 11.5 |
| 0 21 20 | 173.8 | 0.0 | 2 3 20 | 103.7 | 9.8 | 3 9 20 | 50.0 | 11.7 |
| 0 22 0 | 173.6 | − 0.6 | 2 4 0 | 110.4 | 9.4 | 3 10 0 | 41.8 | 11.8 |
| 0 22 40 | 172.9 | 1.2 | 2 4 40 | 116.8 | 9.0 | 3 10 40 | 33.5 | 12.0 |
| 0 23 20 | 171.8 | 1.8 | 2 5 20 | 123.0 | 8.6 | 3 11 20 | 25.1 | 12.1 |
| 1 0 0 | +170.4 | − 2.4 | 2 6 0 | −128.9 | − 8.2 | 3 12 0 | − 16.6 | +12.1 |
| 1 0 40 | 168.5 | 3.0 | 2 6 40 | 134.5 | 7.7 | 3 12 40 | − 8.1 | 12.2 |
| 1 1 20 | 166.2 | 3.5 | 2 7 20 | 139.7 | 7.2 | 3 13 20 | + 0.4 | 12.2 |
| 1 2 0 | 163.5 | 4.1 | 2 8 0 | 144.6 | 6.7 | 3 14 0 | 9.0 | 12.2 |
| 1 2 40 | 160.4 | 4.7 | 2 8 40 | 149.1 | 6.2 | 3 14 40 | 17.5 | 12.1 |
| 1 3 20 | 157.0 | 5.2 | 2 9 20 | 153.3 | 5.7 | 3 15 20 | 26.0 | 12.1 |
| 1 4 0 | +153.2 | − 5.8 | 2 10 0 | −157.1 | − 5.2 | 3 16 0 | + 34.4 | +12.0 |
| 1 4 40 | 149.0 | 6.3 | 2 10 40 | 160.6 | 4.6 | | | |
| 1 5 20 | +144.4 | − 6.8 | 2 11 20 | −163.7 | − 4.1 | | | |

## COÖRDINATES IN THE MEAN APPARENT ELLIPSE.

### SATELLITE III.

| *t* | *x'* | *y'* | *t* | *x'* | *y'* | *t* | *x'* | *y'* |
|---|---|---|---|---|---|---|---|---|
| d h m | ″ | ″ | d h m | ″ | ″ | h d m | ″ | ″ |
| 0 0 0 | + 0.0 | +17.4 | 2 12 0 | +225.4 | −10.1 | 5 0 0 | −262.3 | − 5.6 |
| 0 1 20 | 13.5 | 17.4 | 2 13 20 | 217.3 | 10.8 | 5 1 20 | 266.4 | 4.8 |
| 0 2 40 | 26.9 | 17.3 | 2 14 40 | 208.6 | 11.5 | 5 2 40 | 269.8 | 4.0 |
| 0 4 0 | 40.3 | 17.2 | 2 16 0 | 199.5 | 12.1 | 5 4 0 | 272.6 | 3.2 |
| 0 5 20 | 53.6 | 17.1 | 2 17 20 | 189.9 | 12.7 | 5 5 20 | 274.7 | 2.3 |
| 0 6 40 | 66.8 | 16.9 | 2 18 40 | 179.9 | 13.3 | 5 6 40 | 276.2 | 1.5 |
| 0 8 0 | + 79.8 | +16.7 | 2 20 0 | +169.4 | −13.8 | 5 8 0 | −277.0 | − 0.6 |
| 0 9 20 | 92.7 | 16.4 | 2 21 20 | 158.5 | 14.3 | 5 9 20 | 277.2 | + 0.2 |
| 0 10 40 | 105.3 | 16.1 | 2 22 40 | 147.2 | 14.8 | 5 10 40 | 276.7 | 1.1 |
| 0 12 0 | 117.6 | 15.8 | 3 0 0 | 135.6 | 15.2 | 5 12 0 | 275.5 | 1.9 |
| 0 13 20 | 129.7 | 15.4 | 3 1 20 | 123.7 | 15.6 | 5 13 20 | 273.7 | 2.7 |
| 0 14 40 | 141.5 | 15.0 | 3 2 40 | 111.5 | 16.0 | 5 14 40 | 271.2 | 3.6 |
| 0 16 0 | +153.0 | +14.5 | 3 4 0 | + 99.0 | −16.3 | 5 16 0 | −268.1 | + 4.4 |
| 0 17 20 | 164.1 | 14.0 | 3 5 20 | 86.3 | 16.6 | 5 17 20 | 264.4 | 5.2 |
| 0 18 40 | 174.7 | 13.5 | 3 6 40 | 73.3 | 16.8 | 5 18 40 | 260.1 | 6.0 |
| 0 20 0 | 184.9 | 13.0 | 3 8 0 | 60.2 | 17.0 | 5 20 0 | 255.1 | 6.8 |
| 0 21 20 | 194.7 | 12.4 | 3 9 20 | 47.0 | 17.2 | 5 21 20 | 249.5 | 7.6 |
| 0 22 40 | 204.1 | 11.8 | 3 10 40 | 33.6 | 17.3 | 5 22 40 | 243.3 | 8.3 |
| 1 0 0 | +213.0 | +11.1 | 3 12 0 | + 20.2 | −17.4 | 6 0 0 | −236.6 | + 9.1 |
| 1 1 20 | 221.4 | 10.5 | 3 13 20 | + 6.7 | 17.4 | 6 1 20 | 229.3 | 9.8 |
| 1 2 40 | 229.3 | 9.8 | 3 14 40 | − 6.8 | 17.4 | 6 2 40 | 221.4 | 10.5 |
| 1 4 0 | 236.6 | 9.1 | 3 16 0 | 20.3 | 17.4 | 6 4 0 | 213.0 | 11.1 |
| 1 5 20 | 243.3 | 8.3 | 3 17 20 | 33.7 | 17.3 | 6 5 20 | 204.1 | 11.8 |
| 1 6 40 | 249.5 | 7.6 | 3 18 40 | 47.1 | 17.2 | 6 6 40 | 194.7 | 12.4 |
| 1 8 0 | +255.1 | + 6.8 | 3 20 0 | − 60.3 | −17.0 | 6 8 0 | −184.9 | +13.0 |
| 1 9 20 | 260.0 | 6.0 | 3 21 20 | 73.4 | 16.8 | 6 9 20 | 174.7 | 13.5 |
| 1 10 40 | 264.3 | 5.2 | 3 22 40 | 86.3 | 16.6 | 6 10 40 | 164.1 | 14.0 |
| 1 12 0 | 268.0 | 4.4 | 4 0 0 | 99.0 | 16.3 | 6 12 0 | 153.0 | 14.5 |
| 1 13 20 | 271.1 | 3.6 | 4 1 20 | 111.5 | 16.0 | 6 13 20 | 141.5 | 15.0 |
| 1 14 40 | 273.6 | 2.7 | 4 2 40 | 123.7 | 15.6 | 6 14 40 | 129.7 | 15.4 |
| 1 16 0 | +275.5 | + 1.9 | 4 4 0 | −135.7 | −15.2 | 6 16 0 | −117.6 | +15.8 |
| 1 17 20 | 276.7 | 1.1 | 4 5 20 | 147.2 | 14.8 | 6 17 20 | 105.2 | 16.1 |
| 1 18 40 | 277.2 | + 0.2 | 4 6 40 | 158.4 | 14.3 | 6 18 40 | 92.6 | 16.4 |
| 1 20 0 | 277.0 | − 0.6 | 4 8 0 | 169.3 | 13.8 | 6 20 0 | 79.8 | 16.7 |
| 1 21 20 | 276.2 | 1.5 | 4 9 20 | 179.8 | 13.3 | 6 21 20 | 66.8 | 16.9 |
| 1 22 40 | 274.7 | 2.3 | 4 10 40 | 189.9 | 12.7 | 6 22 40 | 53.6 | 17.1 |
| 2 0 0 | +272.6 | − 3.2 | 4 12 0 | −199.5 | −12.1 | 7 0 0 | − 40.3 | +17.2 |
| 2 1 20 | 269.8 | 4.0 | 4 13 20 | 208.6 | 11.5 | 7 1 20 | 26.9 | 17.3 |
| 2 2 40 | 266.4 | 4.8 | 4 14 40 | 217.3 | 10.8 | 7 2 40 | − 13.4 | 17.4 |
| 2 4 0 | 262.3 | 5.6 | 4 16 0 | 225.5 | 10.1 | 7 4 0 | + 0.1 | 17.4 |
| 2 5 20 | 257.6 | 6.4 | 4 17 20 | 233.1 | 9.4 | 7 5 20 | 13.6 | 17.4 |
| 2 6 40 | 252.3 | 7.2 | 4 18 40 | 240.1 | 8.7 | 7 6 40 | 27.0 | 17.3 |
| 2 8 0 | +246.4 | − 8.0 | 4 20 0 | −246.5 | − 8.0 | 7 8 0 | + 40.4 | +17.2 |
| 2 9 20 | 240.0 | 8.7 | 4 21 20 | 252.3 | 7.2 | | | |
| 2 10 40 | +233.0 | − 9.4 | 4 22 40 | −257.6 | − 6.4 | | | |

## COÖRDINATES IN THE MEAN APPARENT ELLIPSE.

### SATELLITE IV.

| t | x′ | y′ | t | x′ | y′ | t | x′ | y′ |
|---|---|---|---|---|---|---|---|---|
| d h | | | d h | | | d h | | |
| 0 0 | + 0″.0 | +34″.8 | 5 18 | +406″.2 | −19″.3 | 11 12 | −449″.0 | −13″.5 |
| 0 3 | 22.8 | 34.8 | 5 21 | 393.1 | 20.6 | 11 15 | 457.4 | 12.0 |
| 0 6 | 45.6 | 34.7 | 6 0 | 379.2 | 21.9 | 11 18 | 464.8 | 10.5 |
| 0 9 | 68.3 | 34.5 | 6 3 | 364.4 | 23.1 | 11 21 | 471.2 | 8.9 |
| 0 12 | 90.9 | 34.2 | 6 6 | 348.8 | 24.3 | 12 0 | 476.5 | 7.3 |
| 0 15 | 113.2 | 33.9 | 6 9 | 332.5 | 25.5 | 12 3 | 480.8 | 5.7 |
| 0 18 | +135.3 | +33.5 | 6 12 | +315.4 | −26.6 | 12 6 | −484.0 | − 4.1 |
| 0 21 | 157.1 | 33.0 | 6 15 | 297.6 | 27.6 | 12 9 | 486.2 | 2.5 |
| 1 0 | 178.5 | 32.4 | 6 18 | 279.2 | 28.5 | 12 12 | 487.3 | − 0.8 |
| 1 3 | 199.6 | 31.8 | 6 21 | 260.2 | 29.4 | 12 15 | 487.3 | + 0.8 |
| 1 6 | 220.3 | 31.1 | 7 0 | 240.6 | 30.3 | 12 18 | 486.3 | 2.4 |
| 1 9 | 240.4 | 30.3 | 7 3 | 220.5 | 31.1 | 12 21 | 484.2 | 4.0 |
| 1 12 | +260.0 | +29.5 | 7 6 | +199.9 | −31.8 | 13 0 | −480.9 | + 5.7 |
| 1 15 | 279.0 | 28.6 | 7 9 | 178.8 | 32.4 | 13 3 | 476.6 | 7.3 |
| 1 18 | 297.4 | 27.6 | 7 12 | 157.4 | 33.0 | 13 6 | 471.3 | 8.9 |
| 1 21 | 315.2 | 26.6 | 7 15 | 135.6 | 33.5 | 13 9 | 465.0 | 10.5 |
| 2 0 | 332.3 | 25.5 | 7 18 | 113.5 | 33.9 | 13 12 | 457.6 | 12.0 |
| 2 3 | 348.6 | 24.3 | 7·21 | 91.2 | 34.2 | 13 15 | 449.3 | 13.5 |
| 2 6 | +364.1 | +23.1 | 8 0 | + 68.7 | −34.5 | 13 18 | −440.0 | +15.0 |
| 2 9 | 378.9 | 21.9 | 8 3 | 46.0 | 34.7 | 13 21 | 429.7 | 16.4 |
| 2 12 | 392.9 | 20.6 | 8 6 | 23.2 | 34.8 | 14 0 | 418.5 | 17.8 |
| 2 15 | 406.0 | 19.3 | 8 9 | + 0.3 | 34.8 | 14 3 | 406.3 | 19.2 |
| 2 18 | 418.2 | 17.9 | 8 12 | − 22.5 | 34.8 | 14 6 | 393.2 | 20.6 |
| 2 21 | 429.5 | 16.5 | 8 15 | 45.3 | 34.7 | 14 9 | 379.3 | 21.9 |
| 3 0 | +439.8 | +15.0 | 8 18 | − 68.0 | −34.5 | 14 12 | +364.6 | +23.1 |
| 3 3 | 449.1 | 13.5 | 8 21 | 90.5 | 34.2 | 14 15 | 349.1 | 24.3 |
| 3 6 | 457.5 | 12.0 | 9 0 | 112.9 | 33.9 | 14 18 | 332.8 | 25.4 |
| 3 9 | 464.9 | 10.5 | 9 3 | 135.0 | 33.5 | 14 21 | 315.7 | 26.5 |
| 3 12 | 471.3 | 8.9 | 9 6 | 156.8 | 33.0 | 15 0 | 298.0 | 27.5 |
| 3 15 | 476.6 | 7.3 | 9 9 | 178.2 | 32.4 | 15 3 | 279.6 | 28.5 |
| 3 18 | +480.8 | + 5.7 | 9 12 | −199.3 | −31.8 | 15 6 | −260.5 | +29.4 |
| 3 21 | 484.0 | 4.1 | 9 15 | 220.0 | 31.1 | 15 9 | 240.9 | 30.3 |
| 4 0 | 486.2 | 2.5 | 9 18 | 240.1 | 30.3 | 15 12 | 220.8 | 31.1 |
| 4 3 | 487.3 | + 0.8 | 9 21 | 259.7 | 29.5 | 15 15 | 200.2 | 31.8 |
| 4 6 | 487.3 | − 0.8 | 10 0 | 278.7 | 28.6 | 15 18 | 179.2 | 32.4 |
| 4 9 | 486.3 | 2.4 | 10 3 | 297.2 | 27.6 | 15 21 | 157.7 | 33.0 |
| 4 12 | +484.2 | − 4.1 | 10 6 | −315.0 | −26.6 | 16 0 | −135.9 | +33.5 |
| 4 15 | 480.9 | 5.7 | 10 9 | 332.1 | 25.5 | 16 3 | 113.8 | 33.9 |
| 4 18 | 476.6 | 7.3 | 10 12 | 348.4 | 24.4 | 16 6 | 91.5 | 34.2 |
| 4 21 | 471.3 | 8.9 | 10 15 | 363.9 | 23.2 | 16 9 | 69.0 | 34.5 |
| 5 0 | 465.0 | 10.4 | 10 18 | 378.7 | 21.9 | 16 12 | 46.3 | 34.7 |
| 5 3 | 457.7 | 12.0 | 10 21 | 392.7 | 20.6 | 16 15 | 23.5 | 34.8 |
| 5 6 | +449.3 | −13.5 | 11 0 | −405.8 | −19.3 | 16 18 | − 0.6 | +34 8 |
| 5 9 | 439.9 | 15.0 | 11 3 | 418.0 | 17.9 | 16 21 | + 22.2 | 34.8 |
| 5 12 | 429.6 | 16.4 | 11 6 | 429.3 | 16.5 | 17 0 | + 45.0 | +34.7 |
| 5 15 | +418.4 | −17.9 | 11 9 | −439.6 | −15.0 | | | |

## SATELLITE I.

| Date, 1876. | AT GEOCENTRIC SUPERIOR CONJUNCTION. | | | AT TIME OF ECLIPSE. | | Date, 1876. | AT GEOCENTRIC SUPERIOR CONJUNCTION. | | | AT TIME OF ECLIPSE. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Factor for $x'$. | Factor for $y'$. | $p$. | $x$. | $y$. | | Factor for $x'$. | Factor for $y'$. | $p$. | $x$. | $y$. |
| Jan. 1 | 0.863 | −0.752 | +14° 32′.8 | −27″ | −5″ | June 5 | 1.179 | −1.060 | +14° 23′.7 | +29″ | −7″ |
| 8 | 0.876 | 0.767 | 14 5.6 | 29 | 5 | 12 | 1.167 | 1.041 | 14 40.2 | 31 | 6 |
| 16 | 0.890 | 0.784 | 13 39.6 | 30 | 5 | 19 | 1.152 | 1.020 | 14 54.3 | 33 | 6 |
| 23 | 0.906 | 0.802 | 13 15.0 | 32 | 5 | 26 | 1.134 | 0.995 | 15 5.6 | 35 | 6 |
| 30 | 0.923 | 0.821 | 12 52.2 | 33 | 5 | July 3 | 1.115 | 0.968 | 15 14.0 | 36 | 6 |
| Feb. 6 | 0.942 | −0.842 | +12 31.8 | −34 | −5 | 11 | 1.095 | −0.940 | +15 19.2 | +37 | −6 |
| 13 | 0.962 | 0.864 | 12 14.3 | 35 | 5 | 18 | 1.074 | 0.913 | 15 21.2 | 38 | 6 |
| 20 | 0.983 | 0.887 | 11 59.7 | 36 | 6 | 25 | 1.052 | 0.886 | 15 19.9 | 38 | 6 |
| 27 | 1.005 | 0.911 | 11 48.1 | 37 | 6 | Aug. 1 | 1.030 | 0.860 | 15 15.4 | 38 | 5 |
| Mar. 5 | 1.027 | 0.936 | 11 40.2 | 37 | 6 | 8 | 1.009 | 0.835 | 15 7.8 | 38 | 5 |
| 12 | 1.050 | −0.961 | +11 35.9 | −37 | −6 | 15 | 0.989 | −0.811 | +14 57.1 | +37 | −5 |
| 19 | 1.073 | 0.986 | 11 35.3 | 37 | 6 | 22 | 0.969 | 0.789 | 14 43.4 | 36 | 5 |
| 26 | 1.095 | 1.009 | 11 38.7 | 36 | 6 | 29 | 0.950 | 0.768 | 14 26.7 | 35 | 5 |
| Apr. 3 | 1.116 | 1.031 | 11 45.8 | 35 | 6 | Sept. 5 | 0.932 | 0.748 | 14 7.2 | 34 | 5 |
| 10 | 1.135 | −1.052 | +11 56.2 | −34 | −7 | 12 | 0.915 | −0.730 | +13 45.2 | +33 | −5 |
| 17 | 1.153 | 1.069 | 12 9.9 | 32 | 7 | 19 | 0.900 | 0.714 | 13 20.6 | 32 | 4 |
| 24 | 1.168 | 1.082 | 12 26.1 | 30 | 7 | 26 | 0.886 | 0.700 | 12 53.5 | 30 | 4 |
| May 1 | 1.180 | 1.091 | 12 44.8 | 27 | 7 | Oct. 3 | 0.874 | 0.687 | 12 24.0 | 28 | 4 |
| 8 | 1.187 | −1.096 | +13 4.3 | −24 | −7 | 11 | 0.863 | −0.675 | +11 52.5 | −26 | −4 |
| 15 | 1.191 | 1.096 | 13 24.8 | −21 | 7 | 18 | 0.853 | 0.664 | 11 19.0 | 24 | 4 |
| 22 | 1.191 | 1.089 | 13 45 4 | +23 | 7 | 25 | 0.845 | 0.655 | 10 43.6 | 23 | 4 |
| 29 | 1.187 | −1.077 | +14 5.3 | +26 | −7 | Nov. 1 | 0.838 | −0.647 | +10 6.5 | −22 | −4 |

## SATELLITE II.

| Date. 1876. | AT GEOCENTRIC SUPERIOR CONJUNCTION. | | | AT TIME OF ECLIPSE. | | Date. 1876. | AT GEOCENTRIC SUPERIOR CONJUNCTION. | | | AT TIME OF ECLIPSE. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Factor for $x'$. | Factor for $y'$. | $p$. | $x$. | $y$. | | Factor for $x'$. | Factor for $y'$. | $p$. | $x$. | $y$. |
| Jan. 2 | 0.864 | −0.597 | +14° 8′.9 | −33″ | − 7″ | June 7 | 1.176 | −0.831 | +14° 7′.2 | +34″ | −10″ |
| 10 | 0.878 | 0.608 | 13 41.5 | 36 | 7 | 14 | 1.163 | 0.815 | 14 23.3 | 38 | 10 |
| 17 | 0.893 | 0.620 | 13 15.7 | 38 | 7 | 21 | 1.148 | 0.796 | 14 36.6 | 42 | 9 |
| 24 | 0.909 | 0.633 | 12 51.6 | 40 | 8 | 28 | 1.131 | 0.776 | 14 47.1 | 45 | 9 |
| 31 | 0.926 | 0.647 | 12 29.4 | 42 | 8 | July 5 | 1.111 | 0.754 | 14 55.0 | 47 | 9 |
| Feb. 7 | 0.945 | −0.662 | +12 9.7 | −44 | − 8 | 12 | 1.090 | −0.732 | +14 59.7 | +49 | −9 |
| 14 | 0.965 | 0.678 | 11 52.6 | 45 | 8 | 19 | 1.069 | 0.709 | 15 0.9 | 50 | 8 |
| 21 | 0.986 | 0.696 | 11 38 6 | 46 | 8 | 26 | 1.048 | 0.686 | 14 58.9 | 50 | 8 |
| 28 | 1.008 | 0.714 | 11 27.8 | 47 | 9 | Aug. 2 | 1.026 | 0.664 | 14 53.9 | +17 +50 | 8 |
| Mar. 6 | 1.031 | 0.733 | 11 20.6 | 47 | 9 | 10 | 1.005 | 0.643 | 14 45.7 | 17 50 | 8 |
| 13 | 1.054 | −0.752 | +11 17.1 | −47 | − 9 | 17 | 0.984 | −0.624 | +14 34.4 | +17 +49 | −7 |
| 21 | 1.076 | 0.771 | 11 17.3 | 46 | 9 | 24 | 0.964 | 0.606 | 14 20.1 | 16 48 | 7 |
| 28 | 1.098 | 0.790 | 11 21.3 | 45 | 9 | 31 | 0.945 | 0.588 | 14 3.1 | 46 | 7 |
| Apr. 4 | 1.119 | 0.807 | 11 28.9 | 43 | 10 | Sept. 7 | 0.927 | 0.572 | 13 43.4 | 44 | 7 |
| 11 | 1.139 | −0.823 | +11 39.9 | −40 | −10 | 14 | 0.911 | −0.558 | +13 20.8 | +41 | −7 |
| 18 | 1.156 | 0.837 | 11 53.8 | 37 | 10 | 21 | 0.896 | 0.544 | 12 55.8 | 39 | 6 |
| 25 | 1.169 | 0.848 | 12 10.6 | 33 | 10 | 28 | 0.883 | 0.531 | 12 28.5 | 37 | 6 |
| May 2 | 1.180 | 0.856 | 12 29.1 | 29 | 10 | Oct. 5 | 0.871 | 0.519 | 11 59.0 | 35 | 6 |
| 9 | 1.188 | −0.859 | +12 49.0 | −24 | −10 | 13 | 0.860 | −0.507 | +11 27.3 | +32 | −6 |
| 16 | 1.191 | 0.858 | 13 9.5 | −19 | 10 | 20 | 0.851 | 0.496 | 10 53.7 | 30 | 6 |
| 23 | 1.190 | 0.853 | 13 29.8 | +24 | 10 | 27 | 0.843 | 0.487 | 10 18.3 | 27 | 6 |
| 31 | 1.185 | −0.844 | +13 49.1 | +29 | −10 | Nov. 3 | 0.836 | −0.479 | + 9 41.2 | +25 | −6 |

## SATELLITE III.

| Date, 1876. | At Geocentric Superior Conjunction. Factor for x′. | At Geocentric Superior Conjunction. Factor for y′. | At Geocentric Superior Conjunction. p. | At Time of Eclipse. Dis. x. | At Time of Eclipse. Dis. y. | At Time of Eclipse. Reap. x. | At Time of Eclipse. Reap. y. | Date. 1876. | At Geocentric Superior Conjunction. Factor for x′. | At Geocentric Superior Conjunction. Factor for y′. | At Geocentric Superior Conjunction. p. | At Time of Eclipse. Dis. x. | At Time of Eclipse. Dis. y. | At Time of Eclipse. Reap. x. | At Time of Eclipse. Reap. y. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. 2 | 0.864 | —0.730 | +14° 43′.1 | −40″ | −13″ | −25″ | −13″ | June 8 | 1.174 | —1.023 | +14° 42′.5 | +15″ | −18″ | +35″ | −18″ |
| 10 | 0.878 | 0.746 | 14 14.9 | 44 | 13 | 29 | 13 | 15 | 1.161 | 1.002 | 14 58.4 | 22 | 17 | 42 | 17 |
| 17 | 0.893 | 0.764 | 13 48.6 | 47 | 13 | 32 | 13 | 22 | 1.145 | 0.978 | 15 11.5 | 28 | 17 | 48 | 17 |
| 24 | 0.909 | 0.783 | 13 24.0 | 50 | 13 | 35 | 13 | 29 | 1.127 | 0.953 | 15 22.0 | 33 | 16 | 53 | 16 |
| 31 | 0.927 | 0.803 | 13 1.3 | 52 | 14 | 37 | 14 | July 6 | 1.108 | 0.926 | 15 29.0 | 37 | 16 | 57 | 16 |
| Feb. 7 | 0.946 | —0.824 | +12 41.0 | −55 | −14 | −39 | −14 | 14 | 1.087 | —0.899 | +15 32.8 | +40 | −15 | +60 | −15 |
| 14 | 0.966 | 0.847 | 12 23.6 | 57 | 15 | 41 | 15 | 21 | 1.065 | 0.872 | 15 33.6 | 42 | 15 | 61 | 15 |
| 22 | 0.988 | 0.871 | 12 9.4 | 58 | 15 | 42 | 15 | 28 | 1.043 | 0.847 | 15 31.0 | 43 | 15 | 62 | 15 |
| 29 | 1.010 | 0.895 | 11 58.5 | 59 | 15 | 42 | 15 | Aug. 4 | 1.021 | 0.822 | 15 24.9 | 43 | 14 | 62 | 14 |
| Mar. 7 | 1.032 | 0.920 | 11 51.0 | 59 | 16 | 42 | 16 | 11 | 1.000 | 0.798 | 15 15.6 | 43 | 14 | 61 | 14 |
| 14 | 1.055 | —0.945 | +11 47.9 | −58 | −16 | −41 | −16 | 18 | 0.979 | —0.776 | +15 3.4 | +42 | −13 | +60 | −13 |
| 21 | 1.079 | 0.969 | 11 48.5 | 56 | 17 | 39 | 17 | 26 | 0.960 | 0.756 | 14 48.1 | 41 | 13 | 58 | 13 |
| 28 | 1 101 | 0.992 | 11 52.6 | 54 | 17 | 36 | 17 | Sept. 2 | 0.941 | 0.737 | 14 29.8 | 39 | 13 | 56 | 13 |
| Apr. 5 | 1.121 | 1.013 | 12 0.5 | 50 | 17 | 31 | 17 | 9 | 0.923 | 0.720 | 14 8.7 | 36 | 12 | 54 | 12 |
| 12 | 1.140 | 1.031 | 12 12.2 | 46 | 18 | 26 | 18 | 16 | 0.907 | 0.704 | 13 44.9 | 33 | 12 | 51 | 12 |
| 19 | 1.157 | 1.047 | 12 27.0 | 40 | 18 | 20 | 18 | 23 | 0.892 | 0.690 | 13 18.6 | 30 | 12 | 48 | 12 |
| 26 | 1.171 | —1.059 | +12 44.1 | −33 | −18 | −13 | −18 | 30 | 0.879 | —0.678 | +12 49.8 | +27 | −12 | +44 | −12 |
| May 3 | 1.182 | 1.066 | 13 3.1 | 26 | 18 | . . | . . | Oct. 8 | 0.867 | 0.667 | 12 18.7 | 24 | 11 | 41 | 11 |
| 10 | 1.189 | 1.068 | 13 23.5 | −18 | −18 | . . | . . | 15 | 0.857 | 0.657 | 11 45.8 | 20 | 11 | 37 | 11 |
| 17 | 1.192 | 1.064 | 13 44.3 | . . | . . | +11 | −18 | 22 | 0.848 | 0.648 | 11 10.3 | 16 | 11 | 33 | 11 |
| 24 | 1.190 | 1.054 | 14 4.9 | . . | . . | 20 | 18 | 29 | 0.840 | 0.640 | 10 33.2 | +12 | −11 | 29 | 11 |
| June 1 | 1.184 | —1.040 | +14 24.6 | . . | . . | +28 | −18 | Nov. 5 | 0.834 | —0.634 | + 9 54.6 | . . | . . | +25 | −11 |

## THE APPARENT ELEMENTS OF SATURN'S RING.

| Washington Mean Noon. | | *a* Outer Major Axis. | *b* Outer Minor Axis. | *p* Inclination of Northern Semi-minor Axis to Circle of Declination from North to East. | *l* The Elevation of the Earth above the Plane of the Ring. | *l′* The Elevation of the Sun above the Plane of the Ring. | *u* Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on | *u′* |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Equator. | Ecliptic, |
| Jan. | 1 | 35″.67 | 7″.74 | +6° 48′.2 | +12° 32′.4 | +10° 53′.8 | 338° 34′.0 | 295° 40′.5 |
| | 21 | 35.06 | 7.04 | 6 41.1 | 11 35.4 | 10 37.9 | 336 35.3 | 293 41.9 |
| | | 34.78 | 6.36 | 6 32.9 | 10 32.5 | 10 22.0 | 334 26.0 | 291 32.7 |
| Feb. | 10 | 34.83 | 5.73 | 6 24.1 | 9 27.9 | 10 5.9 | 332 14.0 | 289 20.7 |
| March | 1 | 35.21 | 5.16 | 6 15.2 | 8 26.0 | 9 49.8 | 330 8.2 | 287 15.0 |
| | 21 | 35.89 | 4.69 | 6 7.0 | 7 30.9 | 9 33.6 | 328 15.7 | 285 22.6 |
| April | 10 | 36.86 | 4.35 | 6 0.0 | 6 46.6 | 9 17.5 | 326 43.1 | 283 50.1 |
| | 30 | 38.05 | 4.16 | 5 54.9 | 6 16.7 | 9 1.1 | 325 37.0 | 282 44.1 |
| May | 20 | 39.37 | 4.16 | 5 52.3 | 6 3.9 | 8 44.7 | 325 3.1 | 282 10.3 |
| June | 9 | 40.70 | 4.37 | 5 52.4 | 6 9.5 | 8 28.2 | 325 3.8 | 282 11.0 |
| | 29 | 41.85 | 4.77 | 5 55.3 | 6 32.3 | 8 11.6 | 325 38.1 | 282 45.4 |
| July | 19 | 42.63 | 5.30 | 6 0.2 | 7 8.6 | 7 55.0 | 326 40.6 | 283 48.0 |
| Aug. | 8 | 42.90 | 5.87 | 6 6.2 | 7 51.5 | 7 38.3 | 327 58.6 | 285 6.1 |
| Sept. | 17 | 42.58 | 6.32 | 6 12.1 | 8 32.4 | 7 21.5 | 329 16.7 | 286 24.3 |
| Oct. | 7 | 41.74 | 6.57 | 6 16.6 | 9 3.2 | 7 4.8 | 330 18.9 | 287 26.6 |
| | 27 | 40.55 | 6.55 | 6 18.9 | 9 17.9 | 6 47.4 | 330 51.9 | 287 59.6 |
| Nov. | 16 | 39.21 | 6.29 | 6 18.7 | 9 13.7 | 6 30.9 | 330 49.1 | 287 56.9 |
| Dec. | 6 | 37.91 | 5.82 | 6 15.7 | 8 50.4 | 6 14.0 | 330 9.1 | 287 17.0 |
| | 26 | 36.77 | 5.23 | 6 10.2 | 8 10.5 | 5 56.9 | 328 56.2 | 286 4.2 |
| | 31 | 36.53 | 5.06 | +6 8.4 | +7 58.3 | +5 52.6 | 328 33.6 | 285 41.6 |

Factors which are to be multiplied by *a* and *b* to obtain the axes of

| | | | |
|---|---|---|---|
| The inner ellipse of the outer Ring | =0.8801 | log Factor | =9.9445 |
| The outer ellipse of the inner Ring | =0.8599 | " | =9.9344 |
| The inner ellipse of the inner Ring | =0.6650 | " | =9.8228 |
| The inner ellipse of Bond's dusky Ring | =0.5486 | " | =9.7392 |

**Note.—The sign of *l* indicates whether the visible surface of the Ring is northern or southern.**

## THE APPARENT DISCS OF VENUS AND MARS.

### The Versed Sines of their Illuminated Portions, divided by their Apparent Diameters.

| 1876. | | Venus. | Mars. | 1876. | | Venus. | Mars. |
|---|---|---|---|---|---|---|---|
| January | 1 | .913 | .885 | July | 30 | .063 | .999 |
| | 31 | .853 | .908 | August | 29 | .338 | .999 |
| March | 2 | .775 | .930 | September | 28 | .527 | .994 |
| April | 1 | .669 | .952 | October | 28 | .662 | .983 |
| May | 1 | .529 | .970 | November | 27 | .766 | .966 |
| | 31 | .334 | .984 | December | 27 | .848 | .946 |
| June | 30 | .070 | .994 | | | | |

## WASHINGTON MEAN TIME.

## PLANETARY CONSTELLATIONS.

| | d | h | m | | ° | ′ |
|---|---|---|---|---|---|---|
| Jan. | 2 | 2 | 27 | ☌ ♂ ☾ ..... ♂ + | 0 | 35 |
| | 2 | 5 | 32 | ☉ in Perigee. | | |
| | 4 | 16 | 33 | ♀ greatest Hel. Lat. S. | | |
| | 5 | 6 | 3 | ☌ ♆ ☾ ..... ♆ − | 4 | 32 |
| | 8 | 6 | 6 | ☿ greatest Hel. Lat. S. | | |
| | 10 | 19 | – | ♆ stationary. | | |
| | 12 | 10 | 0 | ☌ ♅ ☾ ..... ♅ − | 2 | 53 |
| | 16 | 15 | 10 | ☌ ♀ ♄ ..... ♀ − | 0 | 21 |
| | 20 | 5 | 26 | □ ♆ ☉ | | |
| | 20 | 5 | 28 | ☌ ♃ ☾ ..... ♃ + | 5 | 22 |
| | 27 | 5 | 52 | ☿ in ☊ | | |
| | 27 | 8 | 58 | ☌ ☿ ☾ ..... ☿ + | 3 | 10 |
| | 27 | 10 | 15 | ☌ ♄ ☾ ..... ♄ + | 1 | 41 |
| | 28 | 0 | 35 | ☿ greatest elong. E. | 18 | 25 |
| | 28 | 3 | 47 | ☌ ☿ ♄ ..... ☿ + | 1 | 38 |
| | 28 | 12 | 20 | ☌ ♀ ☾ ..... ♀ + | 0 | 26 |
| | 30 | 23 | 18 | ☌ ♂ ☾ ..... ♂ − | 1 | 10 |
| | 31 | 19 | 48 | ☿ in Perihelion. | | |
| Feb. | 1 | 12 | 37 | ☌ ♆ ☾ ..... ♆ − | 4 | 47 |
| | 3 | 15 | – | ☿ stationary. | | |
| | 4 | 13 | 5 | ♂ in ☊ | | |
| | 6 | 14 | 23 | ☍ ♅ ☉ | | |
| | 8 | 18 | 58 | ☌ ♅ ☾ ..... ♅ − | 2 | 54 |
| | 11 | 3 | 20 | ☿ greatest Hel. Lat. N. | | |
| | 12 | 11 | 52 | ☌ ☿ ☉ Inf. | | |
| | 16 | 19 | 44 | ☌ ♃ ☾ ..... ♃ + | 5 | 44 |
| | 17 | 3 | 41 | ☌ ♄ ☉ | | |
| | 19 | 10 | 53 | □ ♃ ☉ | | |
| | 22 | 18 | 21 | ☌ ☿ ☾ ..... ☿ + | 6 | 33 |
| | 23 | 23 | 54 | ☌ ♄ ☾ ..... ♄ + | 1 | 23 |
| | 25 | 5 | – | ☿ stationary. | | |
| | 27 | 14 | – | β¹ Scorpii may be occulted by ♃ | | |
| | 27 | 15 | 9 | ☌ ♀ ☾ ..... ♀ − | 1 | 53 |
| | 28 | 17 | 58 | ☌ ♂ ☾ ..... ♂ − | 2 | 42 |
| | 28 | 19 | 4 | ☌ ♆ ☾ ..... ♆ − | 4 | 57 |
| | 29 | 15 | 43 | ☌ ♆ ♂ ..... ♆ − | 2 | 12 |
| | 29 | 23 | 29 | ♀ in ☊ | | |
| Mar. | 5 | 15 | 5 | ☿ in ☋ | | |
| | 7 | 2 | 1 | ☌ ♅ ☾ ..... ♅ − | 3 | 1 |
| | 9 | – | – | ☾ eclipsed, vis. at Wash. | | |
| | 9 | 20 | 37 | ☿ greatest elong. W. | 27 | 31 |
| | 12 | 5 | 4 | ☌ ♆ ♀ ..... ♆ − | 2 | 34 |
| | 15 | 6 | 41 | ☌ ♃ ☾ ..... ♃ + | 5 | 55 |
| | 15 | 19 | 27 | ☿ in Aphelion. | | |
| | 17 | 4 | – | ♃ stationary. | | |
| | 17 | 17 | 24 | ☌ ☿ ♄ ..... ☿ − | 0 | 24 |
| | 19 | 13 | 2 | ☉ enters ♈, spring com. | | |
| | 22 | 14 | 46 | ☌ ♄ ☾ ..... ♄ + | 1 | 5 |
| | 23 | 4 | 18 | ☌ ☿ ☾ ..... ☿ − | 0 | 27 |
| | 25 | – | – | ☉ eclipsed, vis. at Wash. | | |
| | 27 | 3 | 23 | ☌ ♆ ☾ ..... ♆ − | 5 | 0 |
| | 28 | 9 | 57 | ☌ ♀ ☾ ..... ♀ − | 2 | 34 |
| Mar. | 28 | 10 | 32 | ☌ ♂ ☾ ..... ♂ − | 3 | 42 |
| | 29 | 3 | 50 | ☌ ♂ ♀ ..... ♂ − | 1 | 9 |
| April | 3 | 6 | 38 | ♀ in Perihelion. | | |
| | 3 | 7 | 12 | ☌ ♅ ☾ ..... ♅ − | 3 | 5 |
| | 4 | 20 | 16 | ☌ ♃ β¹ Scorpii . * − | 0 | 4 |
| | 5 | 5 | 22 | ☿ greatest Hel. Lat. S. | | |
| | 11 | 13 | 4 | ☌ ♃ ☾ ..... ♃ + | 5 | 53 |
| | 19 | 5 | 24 | ☌ ♄ ☾ ..... ♄ + | 0 | 42 |
| | 21 | 19 | 32 | ☌ ☿ ☉ Sup. | | |
| | 21 | 20 | 26 | ☌ ♆ ☉ | | |
| | 22 | 2 | – | ♅ stationary. | | |
| | 22 | 15 | 58 | ☌ ♆ ☿ ..... ♆ − | 1 | 57 |
| | 23 | 14 | 6 | ☌ ♆ ☾ ..... ♆ − | 5 | 3 |
| | 23 | 20 | 11 | ☌ ☿ ☾ ..... ☿ − | 3 | 34 |
| | 24 | 5 | 9 | ☿ in ☊ | | |
| | 25 | 13 | 36 | ♀ greatest Hel. Lat. N. | | |
| | 26 | 1 | 44 | ☌ ♂ ☾ ..... ♂ − | 4 | 7 |
| | 26 | 21 | 21 | ☌ ♀ ☾ ..... ♀ − | 1 | 59 |
| | 28 | 19 | 5 | ☿ in Perihelion. | | |
| | 30 | 7 | 12 | ☌ ♅ ☾ ..... ♅ − | 2 | 58 |
| May | 4 | 6 | 8 | ♀ greatest elong. E. | 45 | 32 |
| | 5 | 10 | 34 | □ ♅ ☉ | | |
| | 8 | 15 | 2 | ☌ ♃ ☾ ..... ♃ + | 5 | 43 |
| | 9 | 2 | 36 | ☿ greatest Hel. Lat. N. | | |
| | 16 | 18 | 26 | ☌ ♄ ☾ ..... ♄ + | 0 | 13 |
| | 17 | 1 | 31 | ☍ ♃ ☉ | | |
| | 20 | 19 | 52 | ☿ greatest elong. E. | 22 | 34 |
| | 21 | 2 | 4 | ☌ ♆ ☾ ..... ♆ − | 5 | 10 |
| | 24 | 11 | 50 | ☌ ☿ ☾ ..... ☿ − | 3 | 23 |
| | 24 | 16 | 25 | ☌ ♂ ☾ ..... ♂ − | 4 | 2 |
| | 25 | 23 | 30 | ☌ ♀ ☾ ..... ♀ − | 1 | 43 |
| | 27 | 19 | 51 | ☌ ♅ ☾ ..... ♅ − | 2 | 43 |
| | 28 | 2 | 47 | □ ♄ ☉ | | |
| June | 1 | 14 | 21 | ☿ in ☊ | | |
| | 2 | 14 | – | ☿ stationary. | | |
| | 4 | 14 | 52 | ☌ ♃ ☾ ..... ♃ + | 5 | 33 |
| | 7 | – | – | ♀ at greatest brilliancy. | | |
| | 11 | 18 | 43 | ☿ in Aphelion. | | |
| | 13 | 3 | 12 | ☌ ♄ ☾ ..... ♄ − | 0 | 15 |
| | 15 | 8 | 33 | ☌ ☿ ☉ Inf. | | |
| | 17 | 4 | – | ♄ stationary. | | |
| | 17 | 13 | 32 | ☌ ♆ ☾ ..... ♆ − | 5 | 25 |
| | 20 | 9 | 23 | ☉ enters ♋, summer com. | | |
| | 20 | 12 | 54 | ♀ in ☋ | | |
| | 20 | 16 | 53 | ☌ ☿ ☾ ..... ☿ − | 9 | 28 |
| | 21 | 11 | – | ♀ stationary. | | |
| | 22 | 7 | 16 | ☌ ♂ ☾ ..... ♂ − | 3 | 31 |
| | 23 | 2 | 14 | ☌ ♀ ☾ ..... ♀ − | 4 | 40 |
| | 24 | 6 | 19 | ☌ ♅ ☾ ..... ♅ − | 2 | 26 |
| | 26 | 19 | – | ☿ stationary. | | |
| | 30 | 13 | 13 | ☉ in Apogee. | | |

## WASHINGTON MEAN TIME.

### PLANETARY CONSTELLATIONS.

| | d | h | m | | ° | ′ |
|---|---|---|---|---|---|---|
| July | 1 | 16 | 11 | ☌ ♃ ☾ . . . . . ♃ + | 5 | 31 |
| | 2 | 4 | 38 | ☿ greatest Hel. Lat. S. | | |
| | 5 | 6 | 34 | ☌ ♂ ♀ . . . . . ♂ + | 4 | 28 |
| | 8 | 7 | 40 | ☿ greatest elong. W. | 20 | 59 |
| | 10 | 8 | 38 | ☌ ♄ ☾ . . . . . ♄ − | 0 | 34 |
| | 13 | 16 | 34 | ☌ ♀ ☉ Inf. | | |
| | 14 | 22 | 54 | ☌ ♆ ☾ . . . . . ♆ − | 5 | 43 |
| | 18 | 15 | - | ♃ stationary. | | |
| | 19 | 7 | 3 | ☌ ☿ ☾ . . . . . ☿ − | 5 | 15 |
| | 19 | 17 | 34 | ☌ ♀ ☾ . . . . . ♀ − | 10 | 43 |
| | 20 | 22 | 44 | ☌ ♂ ☾ . . . . . ♂ − | 2 | 35 |
| | 21 | 4 | 25 | ☿ in ☊ | | |
| | 21 | 19 | 3 | ☌ ⛢ ☾ . . . . . ⛢ − | 2 | 12 |
| | 22 | 8 | 22 | ☌ ☿ ♀ . . . . . ☿ + | 6 | 36 |
| | 24 | 19 | 43 | ♀ in Aphelion. | | |
| | 25 | 18 | 22 | ☿ in Perihelion. | | |
| | 27 | 9 | 5 | □ ♆ ☉ | | |
| | 28 | 21 | 58 | ☌ ♃ ☾ . . . . . ♃ + | 5 | 36 |
| Aug. | 4 | 5 | - | ♀ stationary. | | |
| | 4 | 8 | 18 | ☌ ☿ ☉ Sup. | | |
| | 5 | 1 | 53 | ☿ greatest Hel. Lat. N. | | |
| | 6 | 0 | 46 | ☌ ☿ ♂ . . . . . ☿ + | 0 | 39 |
| | 6 | 11 | 32 | ☌ ♄ ☾ . . . . . ♄ − | 0 | 38 |
| | 7 | 8 | - | ♆ stationary. | | |
| | 7 | 16 | 31 | ☌ ⛢ ☿ . . . . . ⛢ − | 0 | 45 |
| | 7 | 20 | 26 | ♂ greatest Hel. Lat. N. | | |
| | 11 | 5 | 38 | ☌ ♆ ☾ . . . . . ♆ − | 5 | 57 |
| | 11 | 16 | 22 | ☌ ⛢ ♂ . . . . . ⛢ − | 0 | 30 |
| | 12 | 1 | 47 | ☌ ⛢ ☉ | | |
| | 12 | 7 | 36 | ☌ ♂ ☉ | | |
| | 15 | - | - | ♆ in Perihelion. | | |
| | 15 | 3 | 1 | □ ♃ ☉ | | |
| | 16 | 0 | 3 | ☌ ♀ ☾ . . . . . ♀ − | 10 | 38 |
| | 16 | 9 | 31 | ♀ greatest Hel. Lat. S. | | |
| | 18 | 8 | 20 | ☌ ⛢ ☾ . . . . . ⛢ − | 2 | 3 |
| | 18 | 15 | 0 | ☌ ♂ ☾ . . . . . ♂ − | 1 | 12 |
| | 19 | 21 | 12 | ☌ ☿ ☾ . . . . . ☿ + | 0 | 22 |
| | 20 | - | - | ♀ at greatest brilliancy. | | |
| | 25 | 9 | 7 | ☌ ♃ ☾ . . . . . ♃ + | 5 | 42 |
| | 26 | 23 | 53 | ☍ ♄ ☉ | | |
| | 28 | 13 | 36 | ☿ in ☋ | | |
| Sept. | 2 | 14 | 5 | ☌ ♄ ☾ . . . . . ♄ − | 0 | 29 |
| | 3 | - | - | ☾ eclipsed, invis. at Wash. | | |
| | 7 | 10 | 42 | ☌ ♆ ☾ . . . . ♆ − | 6 | 2 |
| | 7 | 17 | 59 | ☿ in Aphelion. | | |
| | 11 | 14 | 0 | ♂ in Aphelion. | | |
| | 13 | 15 | 42 | ☌ ♀ ☾ . . . . . ♀ − | 6 | 43 |
| | 14 | 20 | 20 | ☌ ⛢ ☾ . . . . . ⛢ − | 1 | 55 |
| | 16 | 7 | 57 | ☌ ♂ ☾ . . . . . ♂ + | 0 | 31 |
| | 17 | - | - | ☉ eclipsed, invis. at Wash. | | |
| | 17 | 11 | 52 | ☿ greatest elong. E. | 26 | 27 |
| | 19 | 6 | 15 | ☌ ☿ ☾ . . . . . ☿ + | 0 | 2 |
| Sept. | 21 | 23 | 33 | ☉ enters ♎, autumn com. | | |
| | 22 | 0 | 42 | ☌ ♃ ☾ . . . . . ♃ + | 5 | 43 |
| | 22 | 18 | 13 | ♀ greatest elong. W. | 46 | 8 |
| | 28 | 3 | 54 | ☿ greatest Hel. Lat. S. | | |
| | 29 | 18 | 22 | ☌ ♄ ☾ . . . . . ♄ − | 0 | 18 |
| | 30 | 7 | - | ☿ stationary. | | |
| Oct. | 1 | 19 | 34 | ☌ ⛢ ♀ . . . . . ⛢ + | 1 | 39 |
| | 4 | 15 | 59 | ☌ ♆ ☾ . . . . . ♆ − | 5 | 59 |
| | 11 | 16 | 21 | ♀ in ☊ | | |
| | 12 | 5 | 46 | ☌ ⛢ ☾ . . . . . ⛢ − | 1 | 44 |
| | 12 | 12 | 19 | ☌ ☿ ☉ Inf. | | |
| | 13 | 2 | 46 | ☌ ♀ ☾ . . . . . ♀ − | 1 | 16 |
| | 15 | 1 | 12 | ☌ ♂ ☾ . . . . . ♂ + | 2 | 22 |
| | 16 | 3 | 41 | ☌ ☿ ☾ . . . . . ☿ + | 2 | 14 |
| | 17 | 3 | 41 | ☿ in ☊ | | |
| | 19 | 18 | 56 | ☌ ♃ ☾ . . . . . ♃ + | 5 | 40 |
| | 21 | 15 | - | ☿ stationary. | | |
| | 21 | 17 | 37 | ☿ in Perihelion. | | |
| | 26 | 5 | 41 | ☍ ♆ ☉ | | |
| | 27 | 1 | 18 | ☌ ♄ ☾ . . . . . ♄ − | 0 | 17 |
| | 28 | 3 | 58 | ☿ greatest elong. W. | 18 | 37 |
| | 31 | 23 | 13 | ☌ ♆ ☾ . . . . ♆ − | 5 | 55 |
| Nov. | 1 | 1 | 8 | ☿ greatest Hel. Lat. N. | | |
| | 3 | 18 | - | ♄ stationary. | | |
| | 8 | 12 | 49 | ☌ ⛢ ☾ . . . . . ⛢ − | 1 | 27 |
| | 12 | 1 | 14 | ☌ ♀ ☾ . . . . . ♀ + | 4 | 8 |
| | 12 | 18 | 18 | ☌ ♂ ☾ . . . . . ♂ + | 4 | 0 |
| | 14 | 5 | 57 | ♀ in Perihelion. | | |
| | 14 | 12 | 42 | ☌ ☿ ☾ . . . . . ☿ + | 5 | 36 |
| | 16 | 0 | 57 | □ ⛢ ☉ | | |
| | 16 | 14 | 9 | ☌ ♃ ☾ . . . . . ♃ + | 5 | 35 |
| | 22 | 21 | 25 | □ ♄ ☉ | | |
| | 23 | 10 | 33 | ☌ ♄ ☾ . . . . . ♄ − | 0 | 31 |
| | 24 | 12 | 52 | ♀ in ☋ | | |
| | 27 | 13 | 50 | ☌ ♀ ♂ . . . . . ♀ + | 1 | 15 |
| | 28 | 8 | 20 | ☌ ♆ ☾ . . . . . ♆ − | 5 | 57 |
| | 29 | 1 | - | ⛢ stationary. | | |
| Dec. | 3 | 18 | 19 | ☌ ☿ ☉ Sup. | | |
| | 3 | 22 | 2 | ☌ ♃ ☉ | | |
| | 3 | 23 | 59 | ☌ ☿ ♃ . . . . . ☿ − | 1 | 31 |
| | 4 | 17 | 14 | ☿ in Aphelion. | | |
| | 5 | 19 | 15 | ☌ ⛢ ☾ . . . . . ⛢ − | 1 | 8 |
| | 6 | 4 | 14 | ♀ greatest Hel. Lat. N. | | |
| | 11 | 11 | 4 | ☌ ♂ ☾ . . . . . ♂ + | 5 | 8 |
| | 12 | 3 | 22 | ☌ ♀ ☾ . . . . . ♀ + | 6 | 40 |
| | 14 | 8 | 35 | ☌ ♃ ☾ . . . . . ♃ + | 5 | 30 |
| | 15 | 15 | 26 | ☌ ☿ ☾ . . . . . ☿ + | 2 | 51 |
| | 20 | 17 | 46 | ☉ enters ♑, winter com. | | |
| | 20 | 21 | 15 | ☌ ♄ ☾ . . . . . ♄ − | 0 | 55 |
| | 25 | 3 | 9 | ☿ greatest Hel. Lat. S. | | |
| | 25 | 17 | 53 | ☌ ♆ ☾ . . . . . ♆ − | 6 | 7 |
| | 31 | 0 | 52 | ☉ in Perigee. | | |

## POSITIONS OF THE PRINCIPAL OBSERVATORIES.

(*North Latitudes and West Longitudes are considered as positive.*)

| Place. | Latitude. | Longitude from Washington in Time. | Longitude from Washington in Days. | Longitude from Washington in Arc. |
|---|---|---|---|---|
| | ° ′ ″ | h m s | d | ° ′ ″ |
| *Åbo, | +60 26 56.8 | — 6 37 20.32 | —.2759296 | 260 39 55.2 |
| Albany, | +42 39 49.5 | — 0 13 12.87 | —.0091767 | 356 41 47.0 |
| Allegheny, | +40 27 36.0 | + 0 11 50.66 | +.0082252 | 2 57 39.9 |
| Altona, | +53 32 45.3 | — 5 47 58.54 | —.2416498 | 273 0 21.9 |
| Ann Arbor, | +42 16 48.0 | + 0 26 42.67 | +.0185494 | 6 40 40.0 |
| Armagh, | +54 21 12.7 | — 4 41 36.92 | —.1955662 | 289 35 46.2 |
| Athens, | +37 58 20.0 | — 6 43 7.58 | —.2799488 | 259 13 6.3 |
| Berlin, | +52 30 16.7 | — 6 1 47.77 | —.2512473 | 269 33 3.4 |
| Bilk, | +51 12 25.0 | — 5 35 17.77 | —.2328445 | 276 10 33.4 |
| *Bonn, | +50 43 45.0 | — 5 36 36.02 | —.2337502 | 275 50 59.7 |
| Breslau, | +51 6 56.5 | — 6 16 22.19 | —.2613679 | 265 54 27.1 |
| Brussels, | +50 51 10.7 | — 5 25 41.29 | —.2261723 | 278 34 40.7 |
| Cambridge, (Eng.,) | +52 12 51.8 | — 5 8 35.08 | —.2142949 | 282 51 13.8 |
| Cambridge, (Mass.,) | +42 22 48.1 | — 0 23 41.54 | —.0164530 | 354 4 36.9 |
| Cape of Good Hope, | —33 56 3.2 | — 6 22 8.09 | —.2653711 | 264 27 58.7 |
| Chicago, | +41 50 1.0 | + 0 42 14.26 | +.0293317 | 10 33 33.9 |
| Cincinnati, | +39 6 26.5 | + 0 29 46.94 | +.0206822 | 7 26 44.1 |
| Christiania, | +59 54 43.7 | — 5 51 6.69 | —.2438274 | 272 13 19.6 |
| Clinton, | +43 3 16.5 | — 0 6 35.08 | —.0045727 | 358 21 13.8 |
| Copenhagen, | +55 41 13.6 | — 5 58 31.05 | —.2489703 | 270 22 14.3 |
| *Cracow, | +50 3 50.0 | — 6 28 2.80 | —.2694768 | 262 59 18.0 |
| *Dorpat, | +58 22 47.0 | — 6 55 6.02 | —.2882641 | 256 13 29.7 |
| Dublin, | +53 23 13.0 | — 4 42 50.39 | —.1964165 | 289 17 24.1 |
| Durham, | +54 46 6.4 | — 5 1 52.64 | —.2096370 | 284 31 50.4 |
| Edinburgh, | +55 57 23.2 | — 4 55 29.34 | —.2052007 | 286 7 39.9 |
| *Florence, | +43 46 40.8 | — 5 53 15.12 | —.2453139 | 271 41 13.2 |
| *Geneva, | +46 11 58.8 | — 5 32 49.24 | —.2311344 | 276 47 41.4 |
| Georgetown, | +38 54 26.2 | + 0 0 6.20 | +.0000718 | 0 1 33.0 |
| *Göttingen, | +51 31 47.8 | — 5 47 58.49 | —.2416492 | 273 0 22.7 |
| Gotha, | +50 56 37.5 | — 5 51 3.39 | —.2437892 | 272 14 9.2 |
| Greenwich, | +51 28 38.2 | — 5 8 12.39 | —.2140323 | 282 56 54.2 |
| Hamburg, | +53 33 7.0 | — 5 48 5.95 | —.2417355 | 272 58 30.8 |
| *Helsingfors | +60 9 42.6 | — 6 48 1.32 | —.2833486 | 257 59 40.2 |
| Hudson, | +41 14 42.6 | + 0 17 32.06 | +.0121766 | 4 23 0.9 |
| Kasan, | +55 47 24.2 | — 8 24 41.14 | —.3504761 | 233 49 42.9 |
| Königsberg, | +54 42 50.6 | — 6 30 11.87 | —.2709707 | 262 27 0.2 |
| *Kremsmünster, | +48 3 23.7 | — 6 4 45.03 | —.2532990 | 268 48 44.6 |
| Leipsic, | +51 20 6.3 | — 5 57 46.87 | —.2484592 | 270 33 17.0 |
| Leyden, | +52 9 20.3 | — 5 26 8.57 | —.2264881 | 278 27 51.5 |
| Liverpool, | +53 24 47.7 | — 4 56 12.34 | —.2056984 | 285 56 54.9 |
| Madras, | +13 4 9.2 | —10 29 9.67 | —.4369175 | 202 42 35.0 |
| Madrid, | +40 24 29.7 | — 4 53 27.00 | —.2037847 | 286 38 15.0 |
| *Mannheim, | +49 29 12.9 | — 5 42 3.06 | —.2375354 | 274 29 14.1 |

| Place. | Latitude. | Longitude from Washington in Time. | Longitude from Washington in Days. | Longitude from Washington in Arc. |
|---|---|---|---|---|
| | ° ′ ″ | h m s | d | ° ′ ″ |
| Markree, . . . . | +54 10 31.8 | — 4 34 24.00 | —.1905556 | 291 24 0.0 |
| *Marseilles, . . . | +43 17 49.0 | — 5 29 40.55 | —.2289415 | 277 34 51.8 |
| *Milan, . . . . . | +45 28 0.7 | — 5 44 58.20 | —.2395625 | 273 45 27.0 |
| *Modena, . . . . | +44 38 52.8 | — 5 51 55.53 | —.2443927 | 272 1 7.1 |
| Moscow, . . . . | +55 45 19.8 | — 7 38 29.29 | —.3183946 | 245 22 40.7 |
| *Munich, . . . . | +48 8 45.0 | — 5 54 38.00 | —.2462731 | 271 20 30.0 |
| *Naples, . . . . | +40 51 46.6 | — 6 5 10.95 | —.2535990 | 268 42 15.8 |
| New York, . . . | +40 43 48.5 | — 0 12 15.47 | —.0085124 | 356 56 0.8 |
| Nicolajew, . . . | +46 58 20.6 | — 7 16 6.53 | —.3028534 | 250 58 22.1 |
| *Olmütz, . . . . | +49 35 43.0 | — 6 17 15.43 | —.2619841 | 265 41 8.6 |
| Oxford, . . . . | +51 45 35.5 | — 5 3 9.79 | —.2105300 | 284 12 33.2 |
| *Padua, . . . . | +45 24 2.5 | — 5 55 41.17 | —.2470043 | 271 4 42.5 |
| *Palermo, . . . . | +38 6 44.0 | — 6 1 37.00 | —.2511227 | 269 35 45.0 |
| Paramatta, . . . | —33 48 49.8 | —15 12 18.64 | —.6335491 | 131 55 20.4 |
| *Paris, . . . . . | +48 50 11.0 | — 5 17 33.02 | —.2205211 | 280 36 44.7 |
| Philadelphia, . . . | +39 57 7.5 | — 0 7 33.64 | —.0052505 | 358 6 35.4 |
| *Prague, . . . . | +50 5 18.5 | — 6 5 53.52 | —.2540917 | 268 31 37.2 |
| Pulkowa, . . . . | +59 46 18.1 | — 7 9 31.06 | —.2982757 | 252 37 14.1 |
| Rome, . . . . . | +41 53 53.7 | — 5 58 8.53 | —.2487098 | 270 27 52.1 |
| *San Fernando, . . | +36 27 45.0 | — 4 43 22.42 | —.1967873 | 289 9 23.7 |
| Santiago, . . . . | —33 26 42.0 | — 0 25 30.00 | —.0177083 | 353 37 30.0 |
| Senftenberg, . . . | +50 5 10.1 | — 6 14 3.00 | —.2597570 | 266 29 15.0 |
| *Speyer, . . . . | +49 18 55.4 | — 5 41 58.00 | —.2374769 | 274 30 30.0 |
| *Stockholm, . . . | +59 20 33.8 | — 6 20 26.35 | —.2641939 | 264 53 24.7 |
| St. Petersburg, . . | +59 56 29.7 | — 7 9 25.87 | —.2982161 | 252 38 32.0 |
| *Upsala, . . . . | +59 51 31.5 | — 6 18 42.70 | —.2629942 | 265 19 19.5 |
| *Utrecht, . . . . | +50 5 10.5 | — 5 28 43.67 | —.2282832 | 277 49 5.0 |
| *Vienna, . . . . | +48 12 35.5 | — 6 13 44.09 | —.2595381 | 266 33 58.7 |
| Washington, . . . | +38 53 38.8 | 0 0 0.00 | .0000000 | 0 0 0.0 |
| *Wilna, . . . . . | +54 50 59.1 | — 6 49 23.33 | —.2842978 | 257 39 10.1 |

The authorities for these positions are given in the volumes for 1871 and 1872.

More recent telegraphic determinations, made by the *United States Coast Survey*, give the longitude of Cambridge, Mass., $-0^h\ 23^m\ 41^s.11$, that of Greenwich, $-5^h\ 8^m\ 12^s.12$, and that of Paris, $-5^h\ 17^m\ 33^s.22$.

The correction therefore to be applied to the longitudes of Ann Arbor, Cambridge, (Mass.), Chicago, and Clinton, in the preceding table, is $+0^s.43 = +0^d.0000050 = +6''.45$; to the longitudes of places marked with an *, $-0^s.20 = -0^d.0000023 = -3''.00$; and to the longitudes of other places not in the United States, $+0^s.27 = +0.^d0000031 = +4.''05$.

# ON THE ARRANGEMENT AND USE OF THE TABLES IN THIS EPHEMERIS.

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THIS Part of the AMERICAN EPHEMERIS AND NAUTICAL ALMANAC is designed for the special use of NAVIGATORS and adapted to the Meridian of Greenwich. It contains the Ephemeris of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain Fixed Stars; the Ephemeris of the planets Venus, Mars, Jupiter, and Saturn; and the Mean Places of 198 principal Fixed Stars for the beginning of the year 1876.

*Time.*—Astronomers make use of several different kinds of time; an explanation of the nature of which, and of the method of passing from one to another, properly precedes an explanation of the uses of the Ephemeris.

*Sidereal Time.*—Sidereal Time is measured by the daily motion of the stars, or as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. This point is the vernal equinox, and its hour angle is called the *Sidereal Time.* Astronomical clocks are regulated to sidereal time.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian.

The vernal equinox is not a fixed, but a movable, point on the equator. Its motion is composed of two parts: precession, which is proportional to the time, and is combined with the daily motion of the heavens; and nutation, which is periodical: In consequence of the latter, the daily motion of the equinox is not strictly a uniform measure of time, and the sidereal time in common use might therefore be called *Apparent Sidereal Time;* and *Mean Sidereal Time* would be that reckoned from the transit of the mean equinox; but the irregularity referred to cannot exceed $2^s.3$ in a period of nineteen years, and is, therefore, of no practical importance.

*Solar Time.*—Solar Time is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour angle of the sun is called *Solar Time.* This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the meridian are not exactly equal, but depend upon the variable motion of the sun in right ascension.

The want of uniformity in the sun's motion in right ascension arises from two different causes; one, that the sun does not move in the equator, but in the ecliptic; the other, that the sun's motion in the ecliptic is not uniform.

To avoid the irregularity in time caused by the want of uniformity in the sun's motion, a fictitious sun, called a *Mean Sun,* is supposed to move in the equator with a uniform velocity.

*Mean Time*, which is perfectly equable in its increase, is measured by the motion of this *Mean Sun;* the latter at certain periods agrees with the real sun, then again is in advance of it, and at other times is behind it. The clocks in ordinary use, and chronometers used by Navigators, are regulated to *mean* time.

*True* or *Apparent Time* is measured by the motion of the real sun.

The difference between the *apparent* and *mean* time is called the *Equation of Time.* By means of it we change *apparent* to *mean* time, or the reverse. Thus, if the *apparent* time be given, the *mean* time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I. of the Calendar. If the *mean* time be given, the *apparent* time is obtained by applying the equation of time as directed by the precept on page II. of the Calendar.

*Day.*—The *civil day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each; the first of which is marked A. M., the last is marked P. M.

The *astronomical day* commences at noon of the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical, as well as the civil, time may be either *apparent* or *mean*, according as it is reckoned from *apparent* noon, or from *mean* noon.

The civil day begins twelve hours before the astronomical day; therefore the first part of the *civil day* answers to the last part of the preceding *astronomical day*, and the last part of the *civil day* to the first part of the same *astronomical day.* Thus, January 9th, $2^h$ A. M., *civil time*, is January 8th, $14^h$, *astronomical time;* and January 9th, $2^h$ P. M., *civil time*, is also January 9th, $2^h$, *astronomical time.* The rule, then, for the transformation of the civil time into astronomical time is this: If the civil time is marked A. M., take one from the date, and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.

If the longitude from Greenwich be expressed in time, and, when it is *west, added* to the local time, or, when it is *east, subtracted* from the local time, the result is the corresponding Greenwich time. If the local astronomical time is used, the result is the *Greenwich astronomical time,* which ordinarily is required for the use of this Part of the Ephemeris.

THE CALENDAR.—The Calendar is divided into twelve months, and to each month are assigned eighteen pages, of which the contents are as follows:

Page I. contains the *Apparent Right Ascension and Declination* of the Sun and the *Equation of Time* for each Greenwich *apparent* noon. Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity for a given *Greenwich apparent time.* The hourly differences are given for the instant of apparent noon at Greenwich, and, when great accuracy is required, should be first interpolated for *half* the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is 0. The longitude from Greenwich expressed in time, if *west*, is at that instant the Greenwich apparent time, or time *after* Greenwich apparent noon; if *east*, it is time *before* Greenwich apparent noon. The longitude is therefore employed in reducing the quantities on this page to apparent noon at any place.

The Right Ascension of the sun thus reduced is the *Sidereal Time of Local Apparent Noon*. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on *Sidereal* time.

The Declination of the sun reduced to the meridian, or apparent noon, of the place, is needed in finding the latitude from a meridian altitude of the sun.

As an example of the use of this page, let the sun's declination be required at noon of January 3d, 1876, in longitude 146° 4′ W., or $+ 9^h 44^m 16^s$. We first find—

| | | ° ′ ″ |
|---|---|---|
| **For January 3d, at Greenwich *apparent* noon, ⊙'s declination** | | = 22 52 2.7 S. |
| | ″ | |
| **The diff. for 1 hour, $+14''.34$, multiplied by $9^h$, is** | 129.06 | |
| **The proportional part for $30^m = \frac{1}{2}^h$,** | 7.17 | |
| **" " " $12^m = \frac{1}{5}^h$,** | 2.87 | |
| **" " " $2^m = \frac{1}{30}^h$,** | .48 | |
| **" " " $15^s = \frac{1}{8}$ of $2^m$,** | .06 | |
| **The sum to be subtracted,** | 139.64 or | 2 19.6 N. |
| **The sun's declination required,** | | 22 49 43.1 S. |

The longitude $9^h\ 44^m\ 16^s = 9^h\ 44^m.27 = 9^h.738$; and $14''.34 \times 9.738 = 139''.64 = 2'\ 19''.64$; which is also the reduction obtained in another way.

If the longitude is 146° 4′ E., the reduction, 2′ 19″.6, should be added, and the resulting declination becomes 22° 54′ 22″.3 S.

If greater precision is required, the hourly difference may be first interpolated for $4^h\ 52^m$ (or half the longitude) *after* noon for the *west* longitude, or for $4^h\ 52^m$ *before* noon for the *east* longitude. This will give, in the first case, the hourly difference 14″.57, and the resulting declination 22° 49′ 40″.8 S.; and, in the second case, the hourly difference 14″.11, and the declination 22° 54′ 20″.1 S.

At sea, however, it is ordinarily sufficient to have the declination to the nearest half minute; and the reduction may be found by Table V. of BOWDITCH's *American Practical Navigator*.

The *Equation of Time*, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the *apparent* time, or the time given by an observation of the sun, to obtain the *mean* time. The heading of the column directs the manner in which the equation is to be applied. Where there is a change in the course of the month from addition to subtraction, or the reverse, as in the months of April and June, the two different directions are separated by a line, while a corresponding line below points out the date at which the change takes place. As given on page I. the equation of time is also the *mean* time of *apparent* noon.

On page I. are also given the *Sun's Semidiameter*, which is used in reducing the altitude of a limb of the sun, or the angular distance of the limb from the moon or some other object, to the altitude, or distance, of the centre of the sun; and the *Sidereal Time of the Semidiameter passing the Meridian*, which is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the *first*, or western, limb, to be subtracted from the time of transit of the *second*, or eastern, limb.

Page II. contains for each Greenwich *mean* noon the *Apparent Right Ascension* and *Declination of the Sun*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given for noon, and may be used in reducing them to any given Greenwich *mean* time. The hourly changes may be first interpolated for *half* the Greenwich time, when great precision is required.

The Right Ascension and Declination on pages I. and II. are affected by *Aberration*, and therefore denote the *apparent* position of the *true* sun. Page II. is more conveniently used when the *mean* time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to *mean* time. The quantities can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the local time from observations of the sun, and the latitude from other than meridian observations. The heading of the column directs the manner in which it is to be applied to *mean* time to obtain the *apparent* time.

As given on page II., the equation is the apparent time of mean noon; and in general it is the hour angle of the *true* sun at the instant of *mean* noon.

The *Sidereal Time of Mean Noon* is also the *Right Ascension of the Mean Sun.* It may be reduced for the longitude, or to any Greenwich *mean* time, by using the hourly difference, $9^s.8565$; or by Table III. in the appendix of the *American Ephemeris* for *reducing intervals of mean solar to sidereal time.* Table LI. of Bowditch's *Navigator* may be used for the same purpose when the nearest quarter of a second only is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting solar time to sidereal time. If we add the right ascension of the *true* sun to the *apparent* time, or the right ascension of the *mean* sun to the *mean* time, the result will be the *sidereal* time.

The sidereal time of mean noon reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a *sidereal interval to a mean time interval* in Table II. of the *American Ephemeris*, or Table LII. of Bowditch's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^s.8296$ by the hours and parts of an hour of the given *sidereal* time.

As examples of the use of page II.:—

1. Let the sun's right ascension and the equation of time be required for 1876, Aug. 3, $6^h$ $12^m$ $13^s$ A. M. mean time at a place whose longitude is 118° 14′ E.

| | | h | m | s |
|---|---|---|---|---|
| The local astronomical *mean* time is | Aug. 2, | 18 | 12 | 13 |
| The longitude in time, | — | 7 | 52 | 56 |
| The Greenwich *mean* time, | Aug. 2, | 10 | 19 | 17 |
| | or Aug. 2, | 10.3214 | | |

| | *Sun's R. A.* | | *Equation of time.* |
|---|---|---|---|
| | h m s | | m s |
| Aug. 2, *Noon*, | 8 55 30.96 | Aug. 2, *Noon*, | 5 53.26 *Subtractive.* |
| H. D. $9^s.642 \times 10.3214$ | + 1 39.52 | H. D. $-0^s.215 \times 10.3214 =$ | − 2.22 |
| | 8 57 10.48 | | 5 51.04 |

If greater precision is required, the hourly differences interpolated to $5^h.2$, or $9^s.636$ for the right ascension, and $0^s.209$ for the equation of time, should be used.

The equation of time in this example is *subtractive from* mean time. Its reduction could have been found by Table VI. A. of Bowditch's *Navigator* to seconds only.

2. If the sidereal time is required for the same date and time, we have—

| | h | m | s |
|---|---|---|---|
| Aug. 2, *Noon*, the R. A. of the mean sun is | 8 | 49 | 37.70 |
| Add the H. D. $9^s.8565 \times 10.3214$, or | + | 1 | 41.73 |
| Add the local *astronomical* mean time | 18 | 12 | 13.00 |
| The required sidereal time is, (rejecting $24^h$,) | 3 | 3 | 32.43 |

The reduction $1^m$ $41^s.73$ could have been found in Table III. corresponding to the Greenwich mean time, $10^h$ $19^m$ $17^s$. By Table LI. of Bowditch's *Navigator*, the reduction is $1^m$ $41^s.7$.

3. 1876, Aug. 3, A. M., at a place whose longitnde is 118° 14′ E., suppose the sidereal time to be $3^h\ 3^m\ 32^s.43$, and that the corresponding mean time is required.

The astronomical day is Aug. 2; the longitude in time $-7^h\ 52^m\ 56^s$, or $-7^h.882$.

| | h | m | s |
|---|---|---|---|
| Aug. 2, the sidereal time of Greenwich mean noon is | 8 | 49 | 37.70 |
| The H. D. $9^s.8565 \times (-7.882)$, or the red. for $7^h\ 52^m\ 56^s$ in Table III. | — | 1 | 17.69 |
| The sidereal time of local noon, | 8 | 48 | 20.01 |
| The given sidereal time ($+24^h$, if necessary) | 27 | 3 | 32.43 |
| Subtracting the first from the second gives the *sidereal interval* from noon | 18 | 15 | 12.42 $=18^h.254$ |
| $-9^s.8296 \times 18.254$, or the red. for $18^h\ 15^m\ 12^s$ in Table II., | — | 2 | 59.42 |
| The required astronomical mean time, Aug. 2, | 18 | 12 | 13.00 |

Page III. contains the *Longitude* and *Latitude of the Sun*, and the *Logarithm of its Distance from the Earth*, at Greenwich mean noon of each day. The longitude is given in two columns, headed $\lambda$ and $\lambda'$; $\lambda$ representing the sun's longitude counted from the true equinox of the date; and $\lambda'$ the same coördinate counted from the mean equinox of the beginning of the year. A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The longitudes of the sun are the true longitudes, not affected by aberration. The latitude is referred to the ecliptic of the date.

The last column on page III. contains the *Mean Time of Sidereal* $0^h$, or $24^h$—the right ascension of the mean sun. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich *sidereal* time by means of the hourly difference, $-9^s.8296$. The reduction, however, can be taken directly from Table II. of the American Ephemeris, for *reducing intervals of sidereal time to mean solar time*, or approximately, from Table LII. of Bowditch's *Navigator*.

This column is used in converting sidereal time to mean time. As an illustration, let us take Example 3, above.

| | h | m | s |
|---|---|---|---|
| Aug. 2, the mean time of Greenwich sidereal $0^h$ is | 15 | 7 | 53.15 |
| The H. D. $-9^s.8296 \times (-7.882)$, or the red. for long., Table II., | + | 1 | 17.48 |
| The mean time of local sid. $0^h$, | 15 | 9 | 10.63 |
| Add the given sidereal time, | 3 | 3 | 32.43 $=3^h.059$ |
| The sum is | 18 | 12 | 43.06 |
| $-9^s.8296 \times 3.059$, or the red. for $3^h\ 3^m\ 32^s$ in Table II., | — | | 30.07 |
| The required astronomical mean time, Aug. 2, | 18 | 12 | 12.99 |

It was readily seen, in advance, that the sum of the mean time of sidereal $0^h$ and the given sidereal time would be less than $24^h$. Were it more than $24^h$, the mean time of sidereal $0^h$ should be taken out for Feb. 1, that is the *preceding* astronomical day.

Page IV. contains the *Moon's Semidiameter* and *Equatorial Horizontal Parallax* for every mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time in the same way as the sun's declination and the equation of time in the preceding examples. The sign *plus or minus* (+ or —) prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.273. It may also be obtained from Table XI. of Bowditch's *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1876, Mar. 20, $9^h$ P. M. Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of Mar. 20 is $3''.7$; then

$$\text{as } 12^h : 9^h = 3''.7 : 2''.8$$

which is the correction to be *added to* the semidiameter at noon, because the semidiameter is *increasing*. The moon's semidiameter then, for Mar. 20, $9^h$, is $14'\ 57''.0 + 2''.8$, or $14'\ 59''.8$.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for *half* the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Meridian Passage* at Greenwich, which is given on page IV. to minutes and tenths of minutes, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude turned into time, the time of the moon's meridian passage at any other place may be computed. The reduction may be taken from BOWDITCH's Table XXVIII. by simple inspection. The last column of this page contains the *Age* of the Moon, or the time elapsed since the preceding new moon, to tenths of days.

Pages V. to XII., inclusive, contain the *Moon's Right Ascension* and *Declination* for each day and hour of Greenwich *mean* time. They are accompanied with columns of *differences for one minute*, which are also given at each hour. The right ascension and declination of the moon change so rapidly, that, if they were not given at frequent intervals, the moon would cease to be useful to the practical navigator as a means of determining the latitude and time. The Greenwich mean time, which is required for taking out these quantities, may be taken directly from a well-regulated chronometer, or obtained by applying the longitude, turned into time, to the local mean time of the observer. Each is taken out for the day and hour of the Greenwich *mean* time; the *diff. for* $1^m$ multiplied by the *minutes* and parts of a minute of the Greenwich time; and the product added to, or subtracted from, the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1876, Jan. 7, $15^h\ 15^m\ 20^s$, astronomical mean time at Greenwich:

| | *Right Ascension.* | | *Declination* |
|---|---|---|---|
| | h m s | | ° ′ ″ |
| Jan. 7, $15^h$ | 4 0 . 0.43 | | 25 3 58.3 N. |
| Diff. $2^s.6430 \times 15.333$ | = + 40.53 | $8''.937 \times 15.333$ | = 2 17.0 N. |
| Jan. 7, $15^h\ 15^m\ 20^s$ | 4 0 40.96 | | 25 6 15.3 N. |

The differences iuterpolated for $7^m.67 = 0^h.13$ are for the right ascension $2^s.6441$, and for the declination $8''.915$, which may be used for greater precision.

Page XII. contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII. to XVIII., inclusive, contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, the four larger planets, and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore *astronomical*. All the distances that can be observed on the same day are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W., or E., is affixed to the name of the sun, planet, or star, to indicate that it is on the west, or east, side of the moon.

An observer on the earth's surface having measured a *Lunar Distance*, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the *true*, or *geocentric*, distance. With this distance and the distances in the Ephemeris of the same bodies on the same day, the *Greenwich mean time* of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris between every two successive distances the *logarithm of the seconds of time in which the distance changes* 1″, or, as it is usually called, the *proportional logarithm of the difference*. It is given for the *middle* instant of the two hours between which it is placed.

For computing the *Greenwich time* we have the following rule:

Find in the Almanac the two distances between which the true distance falls; take out the nearest of these, the hours of Greenwich time over it, and the *P. L. of Diff.* between them:

Find the difference between the true distance and the distance taken from the Almanac; and from the *proportional logarithm* of this difference subtract the *P. L. of Diff.* taken from the Almanac:

The result is the *proportional logarithm* of an interval of time to be *added* to the hours of Greenwich time, taken from the Almanac, when the *earlier* Almanac distance is used; to be *subtracted* from the hours of Greenwich time, when the *later* Almanac distance is used.

Another method is, to *add* the *common logarithm* of the difference of the true and the Almanac distances to the *P. L. of Diff.* of the Almanac; the sum will be the *common logarithm* of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time,* given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the *P. L. of Diff.* in the Ephemeris varies, the Greenwich time, found by the methods just described, may not be sufficiently exact. To correct it for such variation, or *2d difference,* take the difference between the *P. L. of Diff.* used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones.) With this difference, and the first correction of the Greenwich time already found, enter Table I. Appendix, and take out the corresponding seconds, which are to be *added* to the approximate Greenwich time if the *Prop. Logs.* in the Ephemeris are *decreasing;* to be *subtracted* if they are *increasing.*

Thus the *Greenwich mean time* of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer time and the Greenwich mean time will be the *error* of the chronometer as found from the Lunar Distance. The agreement or disagreement of this error with that brought up from the error and rate of a previous date, may show whether the chronometer has run well or ill. In this way Lunar Distances can be used as a check upon the chronometer. By a series of carefully observed Lunar Distances on both sides of the moon, the chronometer error can be tolerably well ascertained.

If the observer has found the *local mean time* of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the Lunar Distance will be his longitude.

As an example of finding the Greenwich mean time from a Lunar Distance, suppose that in 1876, Jan. 6, about $4^h$ of Greenwich astronomical time, the corrected distance of the moon's centre from *a* Pegasi is $51^\circ 17' 43''$:

| | | ° ′ ″ | | |
|---|---|---|---|---|
| Corrected distance, | | 51 17 43 | | |
| Distance in the Ephemeris, Jan. 6, $3^h 0^m 0^s$, | | 50 51 39 | P. L. | .2721 |
| Difference, | | 0 26 4 | P. L. | .8392 |
| Time from $3^h$ (*after*) | + 0 48 46 | | P. L. | .5671 |
| Corr. for 2d Diff., Table I, | + 9 | Diff. of P. Logs. | | — 38 |
| Greenwich Mean Time, Jan. 6, | 3 48 55 | | | |

By a Table of common logarithms, or a Table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:

| | | | |
|---|---|---|---|
| P. L. from Ephemeris, | | | .2721 |
| Diff. of distances, | $0^\circ 26' 4'' = 1564''$ | log | .1942 |
| Red. of Greenwich time, | $0^h 48^m 46^s = 2926^s$ | log | .4663 |

the result being the same as by the previous method.

Pages 218 to 241, inclusive, contain the Ephemerides of the four principal planets, Venus, Mars, Jupiter, and Saturn. The Ephemeris of each consists of its *apparent right ascension* and *declination*, and their *variations in one hour*, for each Greenwich mean noon; the *mean time of meridian passage;* and, at the bottom of the page, the *semidiameter* and *horizontal parallax.*

North declinations are marked +, south declinations —. + prefixed to the hourly change of declination of the sun, moon, or a planet, indicates that north declinations are increasing, and south declinations are decreasing; — indicates that north declinations are decreasing, south declinations increasing.

The right ascension and declination are needed in all observations of the planet for time, latitude, or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples of the sun previously given. The mean time of passage across any meridian can be found by dividing the *daily* difference by 24, and using the *hourly* difference thus obtained, as in the case of the moon; or, the reduction can be found by the proportion: As $24^h$ (or 360°) is to the longitude, so is the daily difference to the reduction required.

Pages 242 to 245 contain the Moon's *true Longitude and Latitude* for each Greenwich mean noon and midnight. The right ascensions and declinations of the moon have been computed from them.

Pages 259 to 262 contain the *Mean Places*, with their *annual variations*, of one hundred and ninety-eight Fixed Stars for the beginning of the year 1876. North declinations are marked +; south declinations —.

The right ascension of a star is also the *sidereal time* of its meridian passage. From this we may roughly find the mean time of meridian passage by adding the *mean time of sidereal* $0^h$ on page III. of the Calendar, or subtracting the *sidereal time of mean noon* on page II., (disregarding seconds;) but we can find it more exactly by the processes already given for converting sidereal time to mean time.

The right ascension and declination of a star are generally needed in observations of it for time, latitude, or azimuth. The mean places are sufficiently accurate for most observations at sea; but for more exact observations, the *apparent* places given in the larger Ephemeris should be used.

## THE ASTRONOMICAL PART.

This part is adapted to the meridian of Washington; and Washington time, *astronomical* or *sidereal*, is required in its use. The longitude of Washington from Greenwich is assumed to be $+5^{h}\,8^{m}\,12^{s}$.

*Obliquity of the Ecliptic, &c.*, page 248.—This page contains for every ten days of the year the *Apparent Obliquity*, which is required for the transformation of longitudes and latitudes to right ascensions and declinations, or the reverse; the *Equation of Equinoxes* in longitude and right ascension, or the reduction from the *mean* to the *true* equinox of the date; the *Precession of Equinoxes* in longitude, or the reduction of longitudes from the mean equinox of the *beginning* of the year to the mean equinox of the *date;* the *Sun's Aberration*, which is to be applied to the *true* longitude of the sun, as given in the Ephemeris, to obtain its *apparent* longitude; the *Sun's Horizontal Parallax;* and the *Mean Longitude of the Moon's Ascending Node.*

At the bottom of the page are given the *Mean Obliquity* for the beginning of the year; the *Annual Precession* for the middle of the year, the precession in a sidereal and in a solar day, and the *daily motion* of the moon's node in longitude.

*Fixed Stars.*—Pages 249–257 contain for each mean midnight the logarithms of $A$, $B$, $C$, $D$, also $f$, $G$, $H$, $i$, and logarithms of $g$, $h$, and $i$, (following BESSEL's notation,) for reducing the *mean* places of the Fixed Stars at the beginning of the year to their *apparent* places on any day.

The formulæ from which they are derived, and those in which they are used, are given on page 258. The coefficients are those of PETERS and STRUVE. In terms of right ascension they are expressed in time.

The first set of quantities requires for the star the logarithms of $a$, $b$, $c$, $d$, $a'$, $b'$, $c'$, $d'$, which are to be found in the Star Catalogues. The other set requires no other star constants than the right ascensions and declinations. $f$, $G$, and $H$ are given in time, as well as arc, to facilitate their use with tables of sines, &c., which have the argument in time.

Tables IV., VI. and VII., in the Appendix, facilitate the computation of terms depending on $2\text{☾}$ and $\text{☾}-\Gamma'$.

**For a star near the pole, it is best to compute the reductions with the time constants and the mean right ascension and declination at the date, instead of the beginning of the year, (or the logarithms of *a*, *b*, *c*, &c., reduced to the date), and add such of the following terms as may be of sufficient magnitude:**

**In *Right Ascension.***

$$\left.\begin{array}{l} +0^{s}.000003\ \tau^{2}\sin\alpha \\ -0^{s}.000149\ \tau^{2}\cos\alpha \end{array}\right\}\tan\delta$$

$$\left.\begin{array}{l} -0^{s}.0000650\ \tau^{2}\sin 2\alpha \\ +0^{s}.0000103\ \sin 2\text{☊}\ \cos 2\alpha \\ -0^{s}.0000107\ \cos 2\text{☊}\ \sin 2\alpha \end{array}\right\}\tan^{2}\delta$$

$$\left.\begin{array}{l} +0^{s}.0000620\ \sin 2\odot\ \cos 2\alpha \\ -0^{s}.0000622\ \cos 2\odot\ \sin 2\alpha \end{array}\right\}\sec^{2}\delta$$

$$\left.\begin{array}{l} +0^{s}.0000513\ \sin(\odot+\text{☊})\cos 2\alpha \\ -0^{s}.0000507\ \cos(\odot+\text{☊})\sin 2\alpha \\ +0^{s}.0000097\ \sin(\odot-\text{☊})\cos 2\alpha \\ -0^{s}.0000053\ \cos(\odot-\text{☊})\sin 2\alpha \end{array}\right\}\tan\delta\sec\delta$$

**In *Declination.***

$$\left.\begin{array}{l} +0''.000975\ \tau^{2}\sin^{2}\alpha \\ -0''.000023\ \cos 2\text{☊} \\ -0''.000080\ \cos 2\text{☊}\ \cos 2\alpha \\ -0''.000077\ \sin 2\text{☊}\ \sin 2\alpha \\ +0''.000040\ \cos 2\odot \\ -0''.000467\ \cos 2\odot\ \cos 2\alpha \\ -0''.000465\ \sin 2\odot\ \sin 2\alpha \end{array}\right\}\tan\delta$$

$$\left.\begin{array}{l} -0''.00004\ \cos(\odot+\text{☊}) \\ -0''.00038\ \cos(\odot+\text{☊})\cos 2\alpha \\ -0''.00038\ \sin(\odot+\text{☊})\sin 2\alpha \\ -0''.00038\ \cos(\odot-\text{☊}) \\ -0''.00004\ \cos(\odot-\text{☊})\cos 2\alpha \\ -0''.00007\ \sin(\odot-\text{☊})\sin 2\alpha \end{array}\right\}\sin\delta\tan\delta$$

Pages 259–262 contain the *mean places* and *annual variations* of 198 Fixed Stars for 1876, Jan. $0^{d}-.711$, or the instant when the sun's mean longitude is 280°. $\tau$ on the preceding pages is reckoned from the same epoch. Stars within 25° of either pole are designated by a *.

The *apparent* places of $\alpha$, $\delta$, and $\lambda$ Ursæ Minoris, and of 51 Cephei, are given on pages 263–274 for every upper transit at Washington. They include the terms depending on $2\text{☾}$ and $\text{☾}-\Gamma'$, as well as other small terms on pages 258 and 485, so far as they were of sufficient importance.

The *apparent* places of the remaining 194 stars follow on pages 275–323, in the order of their right ascensions. They are given for every tenth transit, together with *ten times* their *daily* motion at transit; and include all terms of the preceding formulæ exceeding $0^{s}.003$ in right ascension, or $0''.03$ in declination, except those which depend on 2 ☾ and ☾ — $l'$, The mean solar time of transit is also given to the nearest tenth of a day.

*Solar Ephemeris.*—Pages 324–329 contain the *Apparent Right Ascension* and *Declination* of the SUN for each mean and apparent noon at Washington; the *Hourly Motion* at mean noon; the *Equation of Time* at apparent noon with the sign of its application to apparent time; the SUN's *Semidiameter* and the *Sidereal Time of its passing the Meridian;* and the *Sidereal Time of Mean Noon.* The explanation of these quantities and their use has already been given on pages 478–481.

The SUN's *Horizontal Parallax* is on page 248.

*Moon Culminations.*—Pages 330–332 contain the mean solar time of the *Upper Transit* of the MOON's *centre* at Washington, expressed to hundredths of a minute, the *difference* for *one hour* of longitude, and the *Sidereal Time of Semidiameter passing the Meridian,* both given for the instant of transit at Washington. The numbers in the fifth column indicate the STARS in the list of *Moon Culminating Stars*, pages 333–336, within $30^{m}$ of the moon in right ascension. The two preceding and the two next following the moon, are proper to be observed with the moon at each transit. The *bright Limb* of the *Moon* is indicated by the Roman numerals in the last column.

The time of transit at any place, within six hours of Washington in longitude, may be found with sufficient accuracy from the time of the Washington transit by using the hourly difference interpolated for a longitude *half* that of the given place. With this time, reduced to Greenwich time, the moon's right ascension can be taken from the Lunar Ephemeris, pages V–XII of each month, as in the example on page 482. If greater precision is required, or the place is more than six hours from Washington, we may, from the right ascension thus obtained, (which is nearly the *local sidereal time,*) find the *local mean time,* as on page 481, more accurately than before, and thence the *Greenwich mean time,* and with this revise the computation.

As an example, suppose the right ascension of the bright limb of the moon to be required at the transit of January 4, 1876, at Paramatta, in longitude

$15^{h}\ 12^{m}\ 18^{s}.18 = 15^{h}.2050 = 0^{d}.6335$ East of Washington.
$10\ \ 4\ \ 6.18$ " Greenwich.

| | | | | h | m | s |
|---|---|---|---|---|---|---|
| Transit at Washington, (p. 330) | | | Jan. 4, | 6 | 9.11 | |
| Corr. for longitude | | $-15.2050 \times 1^{m}.893$ | — | | 28.79 | |
| Transit at Paramatta, | | | Jan. 4, | 5 | 40.32 | |
| Longitude from Greenwich, | | | — | 10 | 4.10 | |
| Greenwich mean time, | | | Jan. 3, | 19 | 36.22 | |
| Moon's R.A., Jan. 3, | $19^{h}\ 0^{m}$ | | | 0 | 32 | 10.24 |
| Reduction for | + 36.22 | $+36.22 \times 1^{s}.9692$ | + | 1 | | 11.32 |
| Moon's R.A., Jan. 3, | 19 36.22 | | | 0 | 33 | 21.56 |
| Sid. time of semidiameter passing, | | | — | | 1 | 5.28 |
| R.A. of I, or bright limb, | | | | 0 | 32 | 16.28 |

The diff. for $1^{h}$ of long., $1^{m}.893$, is found by interpolating *back* $0^{d}.317$ from that given on page 330; and $1^{s}.9692$, the change of R.A. in $1^{m}$, by interpolating *forward* $18^{m}$ from that given on page 6 for Jan. 3, $19^{h}$. The time of the semidiameter passing the meridian is interpolated *forward* $0^{d}.3665$ from that given on page 330, for Jan. 3, and is subtracted from the right ascension of the centre, as the bright limb is I., or the preceding one.

The Greenwich mean time computed from the right ascension of the centre is $19^{h}\ 36^{m}\ 11^{s}.00$, and the consequent correction of that right ascension, $-0^{s}.02$.

*Moon-Culminating Stars*, pages 333–336.—The *mean* places, with their annual variations, of 174 stars near the moon's path are given for the beginning of the fictitious year (1876, Jan. $0^d$—.711). The names of 35 of them, whose *apparent* places are given in the Ephemeris of the *Fixed Stars*, are printed in SMALL CAPITALS.

The *apparent* places of the others may be obtained by the quantities and formulæ on pages 249–258. To illustrate the use of these, suppose the apparent place of No. 2, *d* Piscium, one of the four stars proper to be observed with the moon on January 4, be required at its transit of that date at Paramatta.

The Washington mean time of the transit at Paramatta is January 3, $14^h\,28^m$, or $0^d.11$ after midnight of January 3. The quantities from page 249, or page 252, are to be taken out for this time.

1st *Method.*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| (Star Tables) | $\log a$ | 0.489 | $\log b$ | 7.943 | $\log c$ | 8.827 | $\log d$ | 7.620 |
| (p. 249) | $\log \mathcal{A}$ | 7.356 | $\log B$ | 0.936*n* | $\log C$ | 0.634*n* | $\log D$ | 1.299 |
| (Star Tables) | $\log a'$ | 1.301 | $\log b'$ | 8.792*n* | $\log c'$ | 9.625 | $\log d'$ | 9.115 |
| | $\log \mathcal{A} a$ | 7.845 | $\log B b$ | 8.879*n* | $\log C c$ | 9.461*n* | $\log D d$ | 8.919 |
| | $\log \mathcal{A} a'$ | 8.657 | $\log B b'$ | 9.728 | $\log C c'$ | 0.259*n* | $\log D d'$ | 0.414 |

| | | | | | |
|---|---|---|---|---|---|
| | | h m s | | | ° ′ ″ |
| (p. 333) | $\alpha =$ | 0 14 13.13 | | $\delta = +$ | 7 30 6.3 |
| | $\mathcal{A} a =$ | + .007 | | $\mathcal{A} a' =$ | +0.04 |
| | $B b =$ | — .076 | | $B b' =$ | +0.53 |
| | $C c =$ | — .289 | | $C c' =$ | —1.82 |
| | $D d =$ | + .083 | | $D d' =$ | +2.59 |
| $\mu = -0^s.005$ | $\tau\mu =$ | .000 | $\mu' = +0''.05$ | $\tau\mu' =$ | 0.00 |
| | *Apparent Place*, $\alpha' =$ | 0 14 12.85 | | $\delta' = +$ | 7 30 7.64 |

2d *Method.*

| | | |
|---|---|---|
| (p. 333) | $\alpha = 0^h\ 14^m.2$ | $\delta = +7^\circ\ 30'.1$ |
| (p. 252) | $G = 18\ \ 1.2$ | $G + \alpha = 18^h\ 15^m.4 = 273^\circ\ 51'$ |
| | $H = 23\ 10.8$ | $H + \alpha = 23\ 25.0 = 351\ 15$ |

| | | | | | |
|---|---|---|---|---|---|
| $\log \frac{1}{15}$ | 8.824 | $\log \frac{1}{15}$ | 8.824 | $\alpha =$ | $0^h\ 14^m\ 13^s.13$ |
| $\log g$ | 0.936 | $\log h$ | 1.309 | $f =$ | + .007 |
| l. sin $(G + \alpha)$ | 9.999*n* | l. sin $(H + \alpha)$ | 9.182*n* | $(g) =$ | — .076 |
| l. tan $\delta$ | 9.119 | l. sec $\delta$ | 0.004 | $(h) =$ | — .208 |
| $\log (g)$ | 8.878*n* | $\log (h)$ | 9.319*n* | $\tau\mu =$ | .000 |
| *Apparent Right Ascension* . . . . . . . . . . . . | | | | $\alpha' =$ | 0 14 12.85 |
| $\log g$ | 0.936 | $\log h$ | 1.309 | | ° ′ ″ |
| l. cos $(G + \alpha)$ | 8.827 | l. cos $(H + \alpha)$ | 9.995 | $\delta = +$ | 7 30 6.3 |
| $\log (g')$ | 9.763 | l. sin $\delta$ | 9.116 | $(g') =$ | + 0.58 |
| | | $\log (h')$ | 0.420 | $(h') =$ | + 2.63 |
| $\log i$ | 0.274*n* | | | $(i) =$ | — 1.86 |
| l. cos $\delta$ | 9.996 | | | $\tau\mu' =$ | 0.00 |
| $\log (i)$ | 0.270*n* | | | | |
| *Apparent Declination* . . . . . . . . . . . . . . . | | | | $\delta' = +$ | 7 30 7.65 |

The MOON's *Semidiameter* and *Equatorial Horizontal Parallax* for each mean noon and midnight are on pages 337–340.* In the moon's Ephemeris, as in that of the sun, the hourly motions belong to the instants for which they are given. The hourly change of semidiameter is equal to .2723 times that of the horizontal parallax.

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*For eclipses and occultations, BURCKHARDT's value of the semidiameter, which is $2''.5$ less, is preferred.

The times of the *Moon's Phases*, *Apogee*, *Perigee*, and *greatest Libration*, are given on page 341; the position of the *Moon's Equator* and the *Moon's mean longitude* on page 342; and a Table for computing the *Libration* of the Moon on page 343.

The *Ephemerides of the seven principal Planets* (pages 344–385) are given both for *mean noon* and the time of *transit*. The *hourly differences* are also given for the same instants. Third differences were used in their computation.

The *Horizontal Parallaxes*, *Vertical Semidiameters*, *and Sidereal Times of the Semidiameters passing the Meridian*, are on pages 386 and 387.

The *Sun's Coördinates* (pages 388–399) are given for each mean noon and midnight, referred to the apparent equinox and equator, and also to the mean equinox and equator at the beginning of the year, (Jan. $0^d.0$.) In the case of the rectangular coördinates, only the last four decimals are given for the mean equinox and equator, and the first three places are to be taken from the apparent equinox and equator. When a change of a unit is to be made in the third place, it is indicated by a corresponding colon (:). The latitude is referred to the ecliptic of the date. The reduction to the mean ecliptic of Jan. 0, is $+0''.488\ \tau \sin(\odot + 187^\circ)$, in which $\tau$ is the time from Jan. 0, in parts of a year.

The *Heliocentric Coördinates* of the Planets (pages 400–406) are referred to the mean equinox and ecliptic of the mean noon of the 2405,000th day of the Julian Period, or 1872, July 25.

The columns $-\frac{\kappa^2}{r^3}x$, &c., contain the quantities $-1600\, m \frac{k^2}{r^3}x$, $-1600\, m \frac{k^2}{r^3}y$, $-1600\, m \frac{k^2}{r^3}z$, in units of the 7th decimal place, in which $m$ denotes the mass of the planet, and $k^2$ the unit of attractive force in the solar system, or $\log k = 8.2355814$.

Page 407 contains the *Inclinations and Longitudes of the Ascending Nodes* at the same epoch, and the *Masses* of the several Planets with their logarithms. The changes of the Inclinations and Nodes in 100 days are also given.

The Heliocentric Coördinates and Masses of the Planets are given for the computation of perturbations.

*Eclipses.*—Pages 408–414 contain the elements necessary for computation and the principal phases of each eclipse of the SUN and MOON. The semidiameters of the moon are $2''.5$, and those of the sun $2''.2$, less than those in the Ephemeris.

The charts of the *Solar Eclipses* show the part of the world in which each is visible. The dotted curves pass through places where the eclipse begins, or ends, at an exact hour of Washington mean time, and aid in finding an approximate time of the beginning, or end, at any place. The limits and central line will give some idea of the magnitude of the eclipse. The longitudes are reckoned west from Washington.

The Tables of *Data of the Solar Eclipses* contain certain quantities* derived from the elements and independent of the place of observation. They are given for successive times at the Washington meridian; and if their values for the *Penumbra* be taken out for a time $T_0$, assumed near that of the beginning, or end, of the eclipse at any place, the prediction for that place may be computed quite accurately by the following formulæ:

Let $\varphi$ = the latitude of the place, + when north,
$\lambda$ = its longitude from Washington, + when west,
(*Bessel*,) $\log e = 8.912205$, $\log(1-e^2) = 9.9970916$, $\sin\chi = e \sin\varphi$,
$h = \sec\chi \cos\varphi$, $k = (1-e^2)\sec\chi \sin\varphi$,

$$a = A - h\sin(\mu - \lambda),$$
$$b = B - Ek + Gh\cos(\mu - \lambda),$$
$$c = -C + Fk - Hh\cos(\mu - \lambda),$$
$$m = \sqrt{bc} \qquad \text{(usually with same sign as } a\text{)}.$$

---

*The formulæ are given in CHAUVENET'S *Spherical and Practical Astronomy*, Vol. I, page 513. The changes of $A$, $B$, and $C$ for *one minute*, or *one second*, are expressed in units of the sixth decimal place.

If $m = a$, the time $T_0$ is correctly chosen. If $m$ differ from $a$, a correction $t$ of the asuumed time may be obtained in seconds by the formulæ,

$$\log \mu' = 1.86167, \qquad a' = A' - \mu' \, h \cos (\mu - \lambda,)$$

$$\tan \tfrac{1}{2} Q = \frac{c}{m} = \frac{m}{b} \qquad b' = B' - \mu' \, G \, h \sin (\mu - \lambda,)$$

$$t = \frac{1000000 \, (m - a)}{a' + b' \cot Q}$$

and a new approximation to the actual Washington time will be

$$T_0' = T_0 + t,$$

with which the computation may be revised.

Thus successive approximations are made until for the last assumed time $T_0$, $m = a$ very closely, and $t$ is quite small. The local mean time of the phenomenon will be, using the last values of $T_0$ and $t$,

$$T_0 + t - \lambda.$$

$Q$ must be taken of the same sign with $a$, and is a sufficiently near approximation to the angular distance of the point of contact reckoned from the *north* point of the sun's limb, + towards the *east.*

For a total or annular eclipse, the prediction of the interior contacts may be made in the same way, using the *Data* for tho *Shadow;* except that $Q$ will have a sign opposite that of $a$ in a total eclipse.

To find $V$, the angular distance of the point of contact from the *Vertex* of the sun's limb, + towards the *left*, we have the formulæ

$$p \sin P = \sin \varphi \qquad c \sin C = \cos P \tan (\mu - \lambda)$$

$$p \cos P = \cos \varphi \cos (\mu - \lambda) \qquad c \cos C = \sin (P - \delta')$$

$$V = Q - C,$$

in which $\delta'$ is the sun's declination.

If the values of $Q$ at the beginning and at the end of the eclipse be found, and their difference (with regard to signs) be denoted by $2\,\theta$, the number of digits eclipsed is

$$12\,(1 + n) \sin^2 \tfrac{1}{2}\theta, \qquad \text{or } 12\,(1 + n) \cos^2 \tfrac{1}{2}\theta,$$

according as $\theta$ is acute or obtuse; $n$ being the quotient of the semidiameter of the moon divided by that of the sun.

$\theta$ may also be found from the formulæ:

$$\tan R = \frac{b'}{a'} \qquad \theta = Q + R$$

(in which $R$ has the sign of $b'$); and the expression of $t$ may be changed to

$$t = 1000000 \, . \, \frac{m - a}{a'} \, . \, \frac{\sin Q \cos R}{\sin \theta}.$$

The following is an example of the computation of the beginning of the Eclipse of March 25, 1876, for the Observatory at Washington, for which

$$\varphi = +38^\circ \, 53' \, 38''.8 \qquad \lambda = 0^\circ \, 0' \, 0''.0$$

$$\begin{array}{llll}
(1) & \log e = 8.912205 & & \\
(2) & \text{l.} \sin \varphi = 9.7978788 & (1) + (2) & \text{l.} \sin \chi = 8.710084 \\
(3) & \log (1 - e^2) = 9.9970916 & & \\
(4) & \text{l.} \sec \chi = 0.0005721 & (2) + (3) + (4) & \log k = 9.7955425 \\
(5) & \text{l.} \cos \varphi = 9.8911513 & (4) + (5) & \log h = 9.8917234
\end{array}$$

By the chart, the Washington mean time of the beginning of the eclipse at Washington is $3^{\text{h}}\,49^{\text{m}}$, for which we take from the table for *Penumbra*, on page 412, the values of $A$, $B$, $C$, &c.

*Computation of t, the correction of $T_0$.*

| | | |
|---|---|---|
| | $\mu$ | $= 55^\circ\ 47'\ 46''.3$ |
| | $\mu - \lambda$ | $= 55\ 47\ 46.3$ |
| (1) | $\text{l. sin}\ (\mu - \lambda)$ | $= 9.9175282$ |
| (2) | $\log h$ | $= 9.8917234$ |
| (3) | $\text{l. cos}\ (\mu - \lambda)$ | $= 9.7498432$ |
| (4) = (1) + (2) | $\log h \sin (\mu - \lambda)$ | $= 9.8092516$ |
| (5) | $\log \mu'$ | $= 1.86167$ |
| (6) | $\log G$ | $= 8.53014$ |
| (7) = (2) + (3) | $\log h \cos (\mu - \lambda)$ | $= 9.6415666$ |
| (8) | $\log H$ | $= 8.63607$ |
| (6) + (7) | $\log G h \cos (\mu - \lambda)$ | $= 8.17171$ |
| (7) + (8) | $\log H h \cos (\mu - \lambda)$ | $= 8.27764$ |
| (5) + (7) | $\log \mu' h \cos (\mu - \lambda)$ | $= 1.50324$ |
| (4) + (5) + (6) | $\log \mu' G h \sin (\mu - \lambda)$ | $= 0.20106$ |
| (20) | $\log b$ | $= 9.850254$ |
| (21) | $\log c$ | $= 9.587183$ |
| (22) = ½ [(20) + (21)] | $\log m$ | $= 9.718718\,n$ |
| (22) — (20) = (21) — (22) | $\text{l. tan}\ \tfrac{1}{2}\ Q$ | $= 9.868464\,n$ |
| *Angle from N. point,* | $Q$ | $= -72^\circ\ 54'.4$ |
| (29) | $\text{l. cot}\ Q$ | $= 9.48788\,n$ |
| (30) | $\log b'$ | $= 1.85854$ |
| (29) + (30) | $\log b' \cot Q$ | $= 1.34642\,n$ |
| (31) | $\log (m - a) + 6$ | $= 3.1703$ |
| (32) | $\log (a' + b' \cot Q)$ | $= 1.8650$ |
| (31) — (32) | $\log t$ | $= 1.3053$ |

| | | |
|---|---|---|
| (9) | $\log E$ | $= 9.999755$ |
| (10) | $\log k$ | $= 9.795542$ |
| (11) | $\log F$ | $= 9.999598$ |
| (9) + (10) | $\log E k$ | $= 9.795297$ |
| (10) + (11) | $\log F k$ | $= 9.795140$ |
| (12) | $A$ | $= +0.11980$ |
| (13) | $-h \sin (\mu - \lambda)$ | $= -0.64454$ |
| (14) | $B$ | $= +1.31767$ |
| (15) | $-E k$ | $= -0.62416$ |
| (16) | $G h \cos (\mu - \lambda)$ | $= +0.01485$ |
| (17) | $-C$ | $= -0.21846$ |
| (18) | $F k$ | $= +0.62394$ |
| (19) | $-H h \cos (\mu - \lambda)$ | $= -0.01895$ |
| (12) + (13) | $a$ | $= -0.52474$ |
| (14) + (15) + (16) | $b$ | $= +0.70836$ |
| (17) + (18) + (19) | $c$ | $= +0.38653$ |
| | $m$ | $= -0.52326$ |
| | $m - a$ | $= +0.00148$ |
| (23) | $A'$ | $= +\ 133.34$ |
| (24) | $-\mu' h \cos (\mu - \lambda)$ | $= -\ 31.86$ |
| (25) | $B'$ | $= +\ 73.79$ |
| (26) | $-\mu' G h \sin (\mu - \lambda)$ | $= -\ 1.59$ |
| (25) + (26) | $b'$ | $= +\ 72.20$ |
| (27) = (23) + (24) | $a'$ | $= +\ 101.48$ |
| (28) | $b' \cot Q$ | $= -\ 22.20$ |
| (27) + (28) | $a' + b' \cot Q$ | $= +\ 79.28$ |

| | | h | m | s |
|---|---|---|---|---|
| *Assumed time,* . . . . . . . . . . . . . . | $T_0 =$ | 3 | 49 | 0.0 |
| *Correction of the assumed time,* . . . . . . . . | $t =$ | | | 20.2 |
| *Washington time of the beginning* . . . . | March 25, | 3 | 49 | 20.2 |

With this as a nearer approximation the computation may be revised.

We have also $C = 46^\circ\ 31'$; the angle from the *Vertex*, $V = -119^\circ\ 25'$; $\theta = -37^\circ\ 28'$, and the magnitude of the eclipse 2.5 digits, or 0.21 of the sun's disc, on the north limb.

*Occultations.*—Pages 415–417 contain a list of such occultations and near approaches as will be visible at Washington during the year 1876. For the latter, the time of nearest approach, the nearest point of the moon's limb, and the distance of the star from the moon's limb, are stated.

Pages 418–450 contain *Elements for facilitating the Prediction of Occultations of Planets and Stars by the Moon.* The list includes all stars to the 6½ magnitude in the *Catalogue of the British Association*, and a few others of less magnitude, contained in the *Almanac Catalogue of Zodiacal Stars* and chiefly belonging to clusters, which can be occulted during the year 1876.

The elements comprise the *Date*, *the Name*, *Magnitude and Declination of the Star;* the *Limiting Latitudes* within which the occultation may be visible; and, at the time of geocentric conjunction of the moon and star in right ascension, the following quantities:

$\mathcal{T}$ = Washington mean time,

$H$ = Hour angle of the star at Washington, + when west;

$$X = \frac{15\ (\alpha - \alpha')}{\pi} \cos \delta = 0, \qquad Y = \frac{\delta - \delta'}{\pi},$$

$$x' = \frac{15\, \Delta \alpha}{\pi} \cos \delta, \quad y' = \frac{\Delta \delta}{\pi},$$ the hourly changes of $x$ and $y$;

in which $\alpha$ and $\delta$ are the true right ascension and declination of the moon,

$\Delta\,\alpha$ and $\Delta\,\delta$, their motions in one hour of mean time,

$\pi$, the moon's equatorial horizontal parallax,

$\alpha'$ and $\delta'$, the apparent right ascension and declination of the star.

The reductions of the mean place of the star at the beginning of the year to its apparent place at the date, are also given to facilitate the reduction of observed occultations.

For any other Washington mean time $T = \mathfrak{T} + t$, we have ($\mu$ being the sidereal equivalent of $t$, and $t$ as a coefficient being expressed in hours)

$h = H + \mu$, the star's hour angle at Washington,

$$x = t\,x', \qquad y = Y + t\,y'.$$

As the moon's motion is here regarded as uniform, the expressions for $x$ and $y$ are more nearly correct the smaller the interval $t$. The exact values, to be employed in the reduction of an observed occultation, are

$$x = \frac{\sin(\alpha - \alpha')\cos\delta}{\sin\pi}$$

$$y = \frac{\sin(\delta - \delta')\cos^2\tfrac{1}{2}(\alpha - \alpha') + \sin(\delta + \delta')\sin^2\tfrac{1}{2}(\alpha - \alpha')}{\sin\pi}$$

in which $\alpha$, $\delta$ and $\pi$ are to be taken from the Ephemeris for the time $T$. But for predicting the times of *immersion* and *emersion*, and the points on the moon's limb where these appearances take place, the preceding expressions suffice to enable the observer to determine when and where to watch for these phenomena.

For the place of observation, let

$\varphi$=its latitude, + when north;

$\lambda$ =its longitude from Washington, + when west;

(*Bessel.*) $\log e = 8.9122\ 05$, $\quad \log(1 - e^2) = 9.9970\ 916$,

$$\sin\chi = e\sin\varphi, \qquad E = (1 - e^2)\sec\chi, \qquad F = \sec\chi.$$

$$\mu' = 54147.8\sin 1'', \qquad \log\mu' = 9.41916.$$

The constants for the place, required both in the prediction of occultations and the reduction of those observed, are $\varphi$, $\lambda$, and $E\sin\varphi$, $F\cos\varphi$, $\mu'\,F\cos\varphi$, or their logarithms.

The values of $E$ and $F$ and their logarithms are given for different latitudes in the following table:

| $\varphi$ | $E$. | $F$. | Log $E$. | Log $F$. |
|---|---|---|---|---|
| 0° | 1—.0067 | 1.0000 | 9.9971 | 0.0000 |
| ±10 | 1—.0066 | 1.0000 | 9.9971 | 0.0000 |
| 20 | 1—.0063 | 1.0004 | 9.9973 | 0.0002 |
| 30 | 1—.0059 | 1.0008 | 9.9975 | 0.0004 |
| 40 | 1—.0053 | 1.0014 | 9.9977 | 0.0006 |
| 50 | 1—.0047 | 1.0020 | 9.9979 | 0.0009 |
| 60 | 1—.0042 | 1.0025 | 9.9982 | 0.0011 |
| 70 | 1—.0037 | 1.0030 | 9.9984 | 0.0013 |
| 80 | 1—.0034 | 1.0033 | 9.9985 | 0.0014 |
| 90 | 1—.0033 | 1.0034 | 9.9985 | 0.0014 |

An occultation will not be visible unless,

1. The latitude of the place is included within the limiting parallels;
2. At the time of occultation, or the local mean time ($T - \lambda$), the sun is **sufficiently** below the horizon;

3. At that time the star is above the horizon, or its local hour angle $(h-\lambda)$ is numerically less than $\tau$ found by the formula

$$\text{oos}\,\tau = -\tan\varphi\tan\delta',$$

A table of $\tau$, or the hour angle of a body in the horizon, computed for the latitude of the place and different declinations, will be useful for such comparisons.

These conditions can generally be determined in advance, as in latitudes less than 60° $(\text{☌}-\lambda)$ may be used instead of $(T-\lambda)$ except within two hours of sunrise or sunset; and $(H-\lambda)$ instead of $(h-\lambda)$ except within half an hour of the star's rising or setting. For these exceptional cases, which, however, are not favorable for observation, the time of *apparent* conjunction in right ascension, or some nearer approximation to the time of occultation, can be subsequently employed.

Having ascertained that an occultation will be visible, we may proceed to compute the times of immersion and emersion by the following formulæ:

1. To find approximately the time[*] of *apparent* conjunction in right ascension, as affected by parallax;

$$u = F\cos\varphi\sin(H-\lambda)$$
$$u' = \mu' F\cos\varphi\cos(H-\lambda)$$

In *hours*, $\qquad (t) = \dfrac{u}{x'-u'}$

Washington time of *apparent* conjunction, $(T) = \text{☌} + (t)$
Local " " " $(T)-\lambda$

The value of $(T)$ to the nearest tenth of an hour is sufficiently accurate. If a closer approximation is desired, the computation may be repeated, using $h = H + (\mu)$ instead of $H$, $(\mu)$ being the sidereal equivalent of $(t)$,

$$x = (t)\,x' \qquad (t') = -\frac{x-u}{x'-u'} \qquad (T') = (T) + (t').$$

2. To find a nearer approach to the time of either phase, let us assume the Washington mean time $T$, which for the first computation may be the computed time of *apparent* conjunction, or some conjectural time near it. For this time find

$$t = T - \text{☌} \qquad h = H + \mu,\ \text{or}\ h-\lambda = H-\lambda+\mu$$
$$x = t\,x' \qquad y = Y + t\,y',$$

and then $T_1$ and $T_2$, the approximate Washington mean times of immersion and emersion, by the following formulæ. The local mean times will be found by subtracting from $T_1$ and $T_2$ the longitude of the place.

$$A\sin B = E\sin\varphi \qquad u = F\cos\varphi\sin(h-\lambda) \qquad u' = \mu' A\cos B$$
$$A\cos B = F\cos\varphi\cos(h-\lambda)\dagger \qquad v = A\sin(B-\delta') \qquad v' = \mu' u\sin\delta'$$

[or, with other auxiliaries than $A$ and $B$,

$$b = F\cos\varphi\cos(h-\lambda) \qquad u' = b\,\mu' \qquad v' = E\sin\varphi\cos\delta' - b\sin\delta']$$

$$m\sin M = x-u \qquad n\sin N = x'-u'$$
$$m\cos M = y-v \qquad n\cos N = y'-v'$$

*Burckhardt.* $\quad k = .27227 \qquad \log k = 9.43500$

$$\cos\psi = \frac{m\sin\overline{M-N}}{k} \qquad \psi < 180^\circ$$

---

[*] It is convenient, but not necessary, to have this time.

[†] If $(h-\lambda)$ be restricted to values numerically less than $12^{h}$, or 180°, $B$ may be taken in the same quadrant with $(h-\lambda)$, and have the same sign as the latitude. For a place where many occultations are observed, tables of $A$, $B$, $u$ and $u'$ for different values of $(h-\lambda)$, or of $E\sin\phi\cos\delta'$ for different declinations, would be convenient.

For *Immersion*. For *Emersion*.

In hours, $t_1 = -\frac{m \cos (M-N)}{n} - \frac{k \sin \psi}{n}$ $t_2 = -\frac{m \cos (M-N)}{n} + \frac{k \sin \psi}{n}$

*Washington mean time*, $T_1 = T + t_1$ $T_2 = T + t_2$

*Local* " " $T_1 - \lambda$ $T_2 - \lambda$

3. Assuming now $T_1 = \delta + t + t_1$ for the immersion, or $T_2 = \delta + t + t_2$ for the emersion, as the Washington time instead of $T$, and recomputing, we can obtain nearer approximation to the times of these phenomena. But the first operation will give the times usually within one or two minutes, which is sufficiently accurate for watching for an immersion. For an emersion a more accurate knowledge is desirable. But for this purpose it will often be sufficient to substitute $(h_2 - \lambda) = (h - \lambda + \frac{1}{2} \mu_2)$ for $(h - \lambda)$ in the computation of $u'$ and $v'$, and, using the same $m$ and $M$ as before, recompute $n$, $N$, $\psi$ and $t_2$, a new correction to be added to $T$.

If log. $m \sin (M-N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\cos \psi < 1$, or $\cos \psi > 1$. In the latter case the impossible value of $\cos \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the Ephemeris of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 0°$, or $180°$, according as $m \sin (M-N)$ is $+$ or $-$; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M-N)}{n}$$

The distance from the moon's limb is then

$$\pi \, [m \sin (M-N) - k],$$

disregarding the sign of $m \sin (M-N)$; or, allowing for the augmentation of the semidiameter,

$$\pi \, [m \sin (M-N) - k] \, [1 + z \sin \pi],$$

where

$$z = A \cos (B - \delta').$$

4. Having found satisfactorily the times of immersion and emersion, and therefore $N$ and $\psi$ in each case, we have as the angle from the *North point* of the moon's limb, positive towards the *West*,

$Q = 90° - N - \psi$ for an *Immersion*,

$Q = 90° - N + \psi$ for an *Emersion;*

and, taking

$$c \sin C = u + t u'$$
$$c \cos C = v + t v',$$

in which the last value of $t$ for the particular phase is properly used, we have as the angle from the *Vertex* of the moon's limb, or that point which is nearest the zenith,

$$V = Q + C$$

also reckoned positive in the same direction as $Q$, i. e., towards the left.

For the image as seen through an inverting telescope, these angles should be increased by 180°.

5. As a check on the accuracy of the work, we have, using the last computed values of the several quantities,

$$[(x-u) + t(x'-u')]^2 + [(y-v) + t(y'-v')]^2 = k^2 = 0.07413;$$

Or, we may compute $u$, $v$, $x$, and $y$, with the last determined time of immersion, or of emersion, and we should have for either, as the condition of the phenomenon,

$$(x-u)^2 + (y-v)^2 = k^2 = 0.07413$$

or, $\log m = \log k = 9.4350$

Greater values than these indicate that the computed time of an immersion is too early, of an emersion too late, by a quantity nearly proportional to the difference.

*Example.*—It is required to find the times of immersion and emersion of B. A. C. 1772, January 8, 1876, at New Plymouth, New Zealand, for which

$$\varphi = -38^\circ\ 58'.0 \qquad \lambda = 7^{\rm h}\ 15^{\rm m}.1.$$

The data for the computation are given on page 418. We see in advance that $\phi$ is between the limiting latitudes; that (☌ $-\lambda$), the local time of *geocentric* conjunction, is near midnight; and that $(H-\lambda)$, the hour angle, or the star's distance from the meridian, is less than an hour and a half, or more than three hours above the horizon.

The constants of the place are :

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | $\mathrm{l.}\sin\phi$ | $=9.7986n$ | | $\mathrm{l.}\cos\phi$ | $=9.8907$ | | $\log F\cos\phi$ | $=9.8913$ |
| | $\log E$ | $=9.9977$ | | $\log F$ | $=0.0006$ | | $\log \mu'$ | $=9.4192$ |
| (1) | $\log E\sin\phi$ | $=9.7963n$ | (2) | $\log F\cos\phi$ | $=9.8913$ | (3) | $\log \mu' F\cos\phi$ | $=9.3105$ |

From page 418, we have for the time of *geocentric* conjunction :

| | | | | |
|---|---|---|---|---|
| *Washington time,* | ☌ $=$ | $18^{\rm h}\ 57^{\rm m}.5$ | $Y=-.8650$ | $\delta'=+29^\circ\ 8'.7$ |
| *Local time,* | ☌ $-\lambda=$ | $11\ 42.4$ | $x'=\ .6169$ | $\mathrm{l.}\sin\delta'=\ 9.6875$ |
| | $H=$ | $+\ 8\ 39.6$ | $y'=+.0386$ | |
| | $H-\lambda=$ | $+\ 1\ 24.5=+21^\circ\ 7'.5$ | | |

1. For an approximation to the time of *apparent* conjunction, we have :

| | | | | |
|---|---|---|---|---|
| (2) | $\log F\cos\phi=9.891$ | (3) | $\log\mu' F\cos\phi=9.310$ | $x'=+.617$ |
| (4) | $\mathrm{l.}\sin(H-\lambda)=9.557$ | (5) | $\mathrm{l.}\cos(H-\lambda)=9.970$ | $u'=+.191$ |
| (6)=(2)+(4) | $\log u=9.448$ | (7) = (3) + (5) | $\log u'=9.280$ | $x'-u'=+.426$ |
| (8) | $\log(x'-u')=9.629$ | | | |
| (6)−(8) | $\log(t)=9.819$ | | $(t)=+0^{\rm h}.65$ | $=+\ 0^{\rm h}\ 39^{\rm m}.0$ |
| | | | ☌ $=$ | $18\ 57.5$ |
| | | *Washington mean time,* | $(T)=$ ☌ $+(t)=$ | $19\ 36.5$ |

2. Assuming this time, for which $t=(t)=+39^{\rm m}.0$, we proceed as follows to find the times of immersion and emersion :

| | | | | | |
|---|---|---|---|---|---|
| (9) Sid. eq. of $t$. | $\mu=+0^{\rm h}\ 39^{\rm m}.1$ | | (33) | $x'=+.6169$ | |
| (10) | $H-\lambda=+1\ 24.5$ | | (34) | $u'=+.1754$ | |
| (11)=(9)+(10) | $h-\lambda=+2\ \ 3.6=+30^\circ\ 54'$ | | (35) | $y'=+.0386$ | |
| | | | (36) | $v'=+.0511$ | |
| (12) | $\mathrm{l}\ \sin(h-\lambda)=9.7106$ | | (37)=(33)−(34) | $x'-u'=n\sin N=+.4415$ | |
| (13)=(2) | $\log F\cos\phi=9.8913$ | | (38)=(35)−(36) | $y'-v'=n\cos N=-.0125$ | |
| (14) | $\mathrm{l.}\cos(h-\lambda)=9.9335$ | | | | |
| | | | (39) | $\log m\sin M=7.0792$ | |
| (15) | $\mathrm{l.}\sin\delta'=9.6875$ | | (40) | $\log m\cos M=8.5038$ | |
| (16)=(12)+(13) | $\log u=9.6019$ | $\mathrm{l.}\,v'=8.7086$ | (41) | $\mathrm{l.}\tan M=8.5754$ | $M=+2^\circ\ 9'$ |
| (17) *Constant,* | $\log\mu'=9.4192$ | | (42) | $\mathrm{l.}\cos M=9.9997$ | |
| (18)=(13)+(14) | $\log A\cos B=9.8248$ | $\mathrm{l.}\,u'=9.2440$ | | | |
| (19)=(1) | $\log A\sin B=9.7963n$ | | (43) | $\log n\sin N=9.6449$ | |
| (20)=(19)−(18) | $\mathrm{l.}\tan B=9.9715n$ | $B=-43^\circ\ 7'$ | (44) | $\log n\cos N=8.0969n$ | |
| (21) | $\mathrm{l.}\cos B=9.8633$ | $\delta'=+29\ \ 9$ | (45) | $\mathrm{l.}\tan N=1.5480n$ | $N=+91\ 37$ |
| (22)=(18)−(21) | $\log A=9.9615$ | $B-\delta'=-72\ 16$ | (46) | $\mathrm{l}\ \sin N=9.9998$ | $M-N=-89\ 28$ |
| (23) | $\mathrm{l.}\sin(B-\delta')=9.9789n$ | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (24)=(22)+(23) | $\log v=9.9404n$ | (47)=(40)−(42) | | $\log m=8.5041$ | (47) | | $\log m=8.5041$ |
| (25) | $t\,x'=0.65\times.6169=x=+.4010$ | (48) | | $\log\frac{1}{k}=0.5650$ | (51) = (46)−(43) | | $\log\frac{1}{n}=0.3549$ |
| (26) | $u=+.3998$ | (49) | | $\mathrm{l.}\sin(M-N)=0.0000n$ | (52) | | $\mathrm{l}\ \cos(M-N)=7.9689$ |
| (27) | $Y=-.8650$ | (50) = (47)+(48)+(49) | | $\mathrm{l.}\cos\psi=9.0691n$ | (53) | | $\log\frac{m}{n}\cos(M-N)=6.8279$ |
| (28) | $t\,y'=0.65\times.0386\ =+.0251$ | | | | | | |
| (29)=(27)+(28) | $y=-.8399$ | (54) | | $\psi=\ 96^\circ\ 44'$ | (56) | | $\mathrm{l.}\sin\psi=9.9970$ |
| (30) | $v=-.8718$ | (55) | | $90^\circ-N=-\ 1\ 37$ | (57)=(51)−(48) | | $\log\frac{k}{n}=9.7899$ |
| (31) = (25)−(26) | $x-u=m\sin M=+.0012$ | (55)−(54) | at Im. | $Q_1=-98\ 21$ | (58) | | $\log\frac{k}{n}\sin\psi=9.7869$ |
| (32) = (29)−(30) | $y-v=m\cos M=+.0319$ | (55)+(54) | at Em. | $Q_2=+95\ \ 7$ | | | |

(59) $-\frac{m}{n}\cos(M-N) = -\overset{h}{0}.001$

(60) $\frac{k}{n}\sin\psi = +0.612$

| For *Immersion.* | | | For *Emersion.* | |
|---|---|---|---|---|
| (59) — (60) | $t_1 = -\overset{h}{0}.613 = -\overset{h}{0}\ \overset{m}{36}.8$ | | (59) + (60) | $t_2 = +\overset{h}{0}.612 = +\overset{h}{0}\ \overset{m}{36}.7$ |
| | $T = 19\ 36.5$ | | | $T = 19\ 36.5$ |
| *Washington mean time,* | $T_1 = T + t_1 = 18\ 59.7$ | | | $T_2 = T + t_2 = 20\ 13.2$ |
| | $\lambda = 7\ 15.1$ | | | $\lambda = 7\ 15.1$ |
| *Local mean time,* | $T_1 - \lambda = 11\ 44.6$ | | | $T_2 - \lambda = 12\ 58.1$ |

3. Assuming these times, for which we have respectively $t + t_1 = +\overset{m}{2}.2$ and $t + t_2 = +\overset{h}{1}\ \overset{m}{15}.7$, and revising the computation, we obtain as a nearer approximation:

| | | | |
|---|---|---|---|
| | $t'_1 = -\overset{h}{0}\ \overset{m}{0}.8$ | | $t'_2 - \overset{h}{0}\ \overset{m}{0}.6$ |
| | $T_1 - \lambda = 11\ 43.8$ | | $T_2 - \lambda\ \ 12\ 57.5$ |
| | $Q_1 = -\ 97°.4$ | | $Q_2 +\ 98°.5$ |
| | $c_1 \sin C_1 = u + t'_1 u'\ \ +\ .2851$ | | $c_2 \sin C_2 = u + t'_2 u' +\ .5002$ |
| | $c_1 \cos C_1 = v + t'_1 v'\ \ -\ .8994$ | | $c_2 \cos C_2 = v + t'_2 v' -\ .8253$ |
| | $C_1\ \ +\ 162°.4$ | | $C_2 +\ 148°.8$ |
| *Angle from Vertex,* | $V_1 = Q_1 + C_1 = +65°.0$ | | $V_2 = Q_2 + C_2 +\ 247°.3$ |

We shall also find for $[(x-u) + t'(x'-u')]^2 + [(y-v) + t'(y'-v')]^2$

At *Immersion,* 0.07420 At *Emersion,* 0.07412

Instead, however, of an entire recomputation, a partial revision, like the following, may be made for correcting the computed time of emersion:

(9) $\frac{1}{2} t_2 = +\overset{h}{0}\ \overset{m}{18}.3 \quad \frac{1}{2}\mu_2 = +\overset{h}{0}\ \overset{m}{18}.4$

(10) $h - \lambda = +2\ \ 3.6$

(11)=(9)+(10) $h_2 - \lambda = +2\ \ 22.0 = +\overset{\circ}{35}\ \overset{\prime}{30}$

(12) $\text{l.}\sin(h_2 - \lambda) = 9.7640$

(13)=(2) $\log F\cos\phi = 9.8913$

(14) $\text{l.}\cos(h_2 - \lambda) = 9.9107$

(15) $\text{l.}\sin\delta' = 9.6875$

(16)=(12)+(13) $\log u = 9.6553 \quad \text{l.}\,v' = 8.7620$

(17) *Constant,* $\log\mu' = 9.4192$

(18)=(13)+(14) $\log A\cos B = 9.8020 \quad \text{l.}\,u' = 9.2212$

(33) $x' = +\ .6169$

(34) $u' = +\ .1664$

(35) $y' = +\ .0386$

(36) $v' = +\ .0578$

(37) $x' - u = n\sin N = +\ .4505$

(38) $y' - v' = n\cos N = -\ .0192$

(43) $\log n\sin N = 9.6537$

(44) $\log n\cos N = 8.2833n \qquad M = +\overset{\circ}{2}\ \overset{\prime}{9}$

(45) $\text{l.}\tan N = 1.3704n \qquad N = +92\ 26$

(46) $\text{l.}\sin N = 9.9996$

$M - N = -90\ 17$

(47) From 1st Comp. $\log m = 8.5041$

(48) $\log\frac{1}{k} = 0.5650$

(49) $\text{l.}\sin(M-N) = 0.0000n$

(50)=(47)+(48)+(49) $\text{l.}\cos\psi = 9.0691n$

(54) $\psi = +\overset{\circ}{96}\ \overset{\prime}{44}$

(55) $90° - N = -\ 2\ 26$

(55)+(54) *Angle from N. point,* $Q_2 = +\ 94\ 18$

(47) $\log m = 8.5041$

(51)=(46)−(43) $\log\frac{1}{n} = 0.3459$

(52) $\text{l.}\cos(M-N) = 7.6942n$

(53) = (47) + (51) + (52) $\log\frac{m}{n}\cos(M-N) = 6.5442n$

(56) $\text{l.}\sin\psi = 9.9970$

(57)=(51)−(48) $\log\frac{k}{n} = 9.7809$

(58) $\log\frac{k}{n}\sin\psi = 9.7779$

(59) $-\frac{m}{n}\cos(M-N) = +\overset{h}{0}.0000$ (59) + (60) $t'_2 = +\overset{h}{0}.6000 = \overset{h}{0}\ \overset{m}{36}.0$

(60) $\frac{1}{k}\sin\psi = +\overset{h}{0}.5997$ $(T) = 19\ 36.5$

*Washington mean time,* $T_2 = (T) + t'_2 = 20\ 12.5$

*Local mean time,* $T_2 - \lambda = 12\ 57.4$

*Jupiter's Satellites*, pages 451–471.—These pages contain for the several Satellites—

1. The Washington mean times of the occultations, eclipses, transits and transits of shadows, arranged in the order of time. Those visible at Washington, or which occur when the sun is more than 8° below and Jupiter more than 8° above the horizon of that place, are indicated by a *.

2. A diagram for each month constructed for the eclipse which occurs nearest the middle of the month, showing the phases of the eclipse for an inverting telescope. The stars indicate the points of disappearance and reappearance, distinguished by *d* and *r*. The space between them shows the position of the shadow of the planet.

3. Washington mean times of geocentric superior conjunctions, arranged for each satellite separately.

4. The rectangular coördinates $x'$ and $y'$ for successive times reckoned from the next preceding superior conjunction, computed for a constant major axis and maximum minor axis of the apparent ellipse described by the satellite as seen from the sun at its mean distance from the planet.

5. The *factors* by which $x'$ and $y'$ are to be multiplied to obtain the actual coördinates $x$ and $y$ for the apparent ellipse, as seen from the earth at any date; the inclination $p$ of the minor axis to the circle of declination, reckoned from the *north*, positive towards the *east;* and the actual coördinates $x$ and $y$ at the times of eclipse of each satellite.

The coördinates are referred to the centre of the primary and to the major and minor axes of the ellipse described by the satellite, and are expressed in seconds of arc. $x$ is positive when on the *east* side of the planet; $y$ is positive when *north*. By means of them the configurations of the satellite can be found at any time.

The *Elements of Saturn's Ring*, page 472, give the *apparent* magnitude and position of its several components for each 20 days. The *apparent Discs of* Venus and Mars are given on the same page for each 30 days.

The *Phenomena*, pages 473 and 474, include the times of conjunction, opposition, and quadrature, perihelion and aphelion, stationary points, and conjunction, with the moon in right ascension, of the principal planets.

The *Positions of the Principal Observatories* are given on pages 475 and 476. The authorities for these positions, and the longitudes with reference to the meridians upon which they actually depend, will be found in the American Ephemeris for 1870, 1871, and 1872.

# APPENDIX.

# CONSTRUCTION OF THE ASTRONOMICAL AND NAUTICAL EPHEMERIDES FOR 1876.

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THE Precession of the Equinoxes, the Mean Obliquity of the Ecliptic, and the Constant of Aberration (p. 250) are taken from STRUVE and PETERS. They are:

Precession[*] $=50''.2411+0''.0002268\,t$,
Obliquity[†] $=23^\circ\,27'\,54''.22-0''.4645\,t-0''.0000014\,t^2$,
Aberration[‡] $=20''.4451\pm0''.0111$,

in which $t$ is the number of years after 1800.

The Nutation of the Apparent Obliquity and the Equation of the Equinoxes are computed from PETERS' formulæ given in his *Numerus Constans Nutationis*, pp. 46–48, and reprinted in the volume of this Ephemeris for 1855. These quantities have been used in all computations relating to the Fixed Stars.

In the Ephemerides of the Sun, Moon, and Planets, the Obliquity of the Ecliptic and the Nutation of HANSEN and OLUFSEN'S *Tables du Soleil* have been used; but the same Aberration as for the fixed stars. The Mean Obliquity exceeds that of PETERS by $0''.34$.

The General Constants for Star Reduction are adapted to the formulæ given on page 258. They are computed from the *Tables to facilitate the Reduction of Places of the Fixed Stars, prepared for the use of the American Ephemeris and Nautical Almanac*, Washington, 1869, which have been used in the preparation of previous volumes of this work subsequent to that of 1861.

The Mean Places of the 198 Standard Stars have also been taken from the same tables. Dr. GOULD'S *Standard Places of Fundamental Stars, U. S. Coast Survey*, Washington, 1866, is the authority given for 48 Northern Circumpolar Stars and 128 Time Stars; the *British Nautical Almanac* for 1848 for 13 Stars south of $-40^\circ$ declination; and WOLFER'S *Tabulæ Reductionum Observationum Astronomicarum*, Berlin, 1858, for Sirius, Castor, (the mean of the components,) Procyon, $\gamma$ Draconis, and $\alpha$ Cephei. The magnitudes, except of the 13 Southern Stars, are ARGELANDER'S.

The reductions from the mean to the apparent places of the Stars contained in WOLFER'S *Tabulæ Reductionum*, except $\alpha$ and $\delta$ Ursæ Minoris, have been derived from that work; the reductions of the rest from the *Tables of the American Ephemeris*. These reductions include the terms of the formulæ on pages 258 and 485, so far as sensible, except those depending on the moon's longitude. These terms, however, have been applied to the four stars whose places are given for every day. Their values for other stars may readily be found by Tables VI. and VII. of this Appendix.

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[*] PETERS' *Numerus Constans Nutationis*, p. 71.

[†] Ibid., pp. 66 and 71.

[‡] STRUVE'S *Constant de l'Aberration*, p. 47.

# APPENDIX.

To the position of Sirius, as derived from WOLFERS, (the correction of the "*Tabula Subsidiaria*" being omitted), have been applied the terms given by AUWERS,*

$$q=+0^{s}.0647-0^{s}.000718\ (t-1860)+0^{s}.1510\cos\ (u+\ 1^{\circ}\ 6')$$

$$r=-0''.630\ -0''.00044\ \ (t-1860)+1''.445\ \ \sin\ (u+23^{\circ}\ 30')$$

in which $u$, the eccentric anomaly from the inferior apsis, is found by the formula

$$u-e\sin u=n\ (t-T),$$

from the elements

$T=1793.830$, passage through the inferior apsis,
$e=\ \ 0.6010$, the eccentricity,
$n=\ \ 7^{\circ}.28475$, mean annual motion in orbit,
$49^{y}.418$, period of revolution.

The Mean Places of such of the Moon-culminating Stars as are not found in the list of standard stars, have been taken in order of preference from the *Almanac Catalogue of Zodiacal Stars printed for the use of the American Ephemeris and Nautical Almanac, Washington*, 1864; *the Greenwich Twelve-Year Catalogue;* and the *Catalogue of the British Association.*

The Ephemeris of the Sun† is constructed from HANSEN and OLUFSEN's *Tables du Soleil*, Copenhagen, 1853, except that Struve's Aberration has been used. This is equivalent to adding 0''.19 to the longitudes, but does not affect the right ascensions and declinations. The Sun's rectangular equatorial coördinates have been computed from the longitudes and latitudes by the following formulæ:

$$\begin{aligned}
X\ &=R\cos\lambda\\
Y\ &=R\sin\lambda\cos\omega-19.3\ R\,\beta\\
Z\ &=R\sin\lambda\sin\ \omega+44.5\ R\,\beta\\
X'&=X+Y\sec\omega\ \varDelta\,\lambda\\
Y'&=Y-X\cos\omega\ \varDelta\,\lambda+Z\ \varDelta\,\omega-\ \ 9.4\ \tau\ R\sin(\odot+187^{\circ})\\
Z'&=Z-X\sin\ \omega\ \varDelta\,\lambda-Y\ \varDelta\,\omega+21.7\ \tau\ R\sin(\odot+187^{\circ})
\end{aligned}$$

in which $\lambda$, $\beta$ and $\omega$ are referred to the equinox and ecliptic of the date; $\varDelta\,\lambda$ is the reduction of longitude for precession and nutation from Jan. 0; $\varDelta\,\omega$ the reduction of the mean to the apparent obliquity; $\tau$ the part of the year since Jan. 0; and the numerical coefficients are in units of the 7th place of decimals.

The mean equatorial Horizontal Parallax of the Sun, adopted from Prof. NEWCOMB's *Investigation of the Distance of the Sun and the Elements which depend on it*,‡ is 8''.848. The adopted Semidiameter of the Sun at the Earth's mean distance is 16' 2''.

The Ephemeris of the Moon is constructed from PEIRCE's *Tables of the Moon*, 2d *edition*, Washington, 1865. They include the *Tables of the Moon's Parallax* constructed from WALKER's and ADAMS's formulæ.

The Semidiameter of the Moon is computed from the Moon's Horizontal Parallax by the formula,

$$S=.272274\ \pi+2''.5.$$

A semidiameter 2''.5 less is found to be better adapted for the computation of eclipses and occultations.

The Ephemeris of Mercury is derived from Prof. WINLOCK's *Tables of Mercury*, Washington, 1864. They are based on the theory of LE VERRIER, published in the Additions to the *Connaissance des Temps* for 1848.

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* *Astronomische Nachrichten*, No. 1506.

† From CARLINI's Tables before 1858.

‡ *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1865, Appendix II.

# CONSTRUCTION OF THE ALMANAC.

The Ephemeris of Venus is derived from Mr. G. W. Hill's *Tables of Venus*, Washington, 1872.

The Ephemeris of Mars is derived from manuscript Tables constructed from Lindenau's Tables in the same manner as the Tables of Venus. Mr. Hugh Breen's results contained in his paper *On the Corrections of* Lindenau's *Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX., have also been discussed and applied; and Le Verrier's secular variations of the elements are likewise adopted. The following are the corresponding corrected elements, and annual variations for Washington, 1855.0:

$$
\begin{aligned}
L &= 320^{\circ}\ 13'\ 33''.87 + 689101''.1527\,t. \\
\pi &= 333\ \ 23\ \ 17.84 + 65''.9990\,t. \\
\Omega &= 48\ \ 25\ \ 55.29 + 27''.6997\,t. \\
i &= 1\ \ 51\ \ \ 2.20 - 0''.02141\,t. \\
e &= 19238''.75 + 0''.18549\,t. \\
n &= 689050''.8927 \\
a &= 1.5236915
\end{aligned}
$$

The Ephemeris of Jupiter is derived from manuscript Tables constructed from Bouvard's Tables, with such changes as were required to make them correspond more nearly to the formulæ.

The Ephemeris of Saturn is derived from Bouvard's Tables. The perturbations produced by Jupiter, and the change of the Great Inequality since 1840, have been increased by $\frac{1}{50}$ of their value. Adams's Table in the *British Nautical Almanac* for 1851 has been substituted for Bouvard's Table XLII. The following corrections of the elements for 1855.0 have also been introduced:

corr. mean long. $= + 4''.9$
corr. long. of node $= - 143''.0$
corr. inclination $= - 5''.7 + 0''.0149\,t.$

The Ephemeris of Uranus is derived from Tables prepared by Prof. Newcomb, but not yet published.

The Ephemeris of Neptune is derived from Prof. Newcomb's *Tables of Neptune*, Washington, 1866.

The eclipses and elongations of Jupiter's Satellites are computed from Damoiseau's Tables.

The semidiameters of the Planets are computed from the following values:

| | Semidiameter. | Log Dist. | Authority. |
|---|---|---|---|
| Mercury | 3″.34 | 0.00 | Le Verrier, *Theory of Mercury*. |
| Venus | 8.546 ± 0.086 | 0.00 | Peirce, from the Washington Observations of 1845 and 1846, made with the mural circle. |
| Mars (polar) | 2.842 ± 0.057 | 0.25 | |
| Jupiter (polar) | 18.78 ± 0.067 | 0.70 | |
| Saturn (polar) | 8.77 ± 0.039 | 0.95 | |
| Uranus | 1.68 ± 0.3 | 1.30 | |
| Jupiter (equat.) | 20.00 | 0.70 | |
| Saturn (equat.) | 9.38 | 0.95 | |

The apparent elements of Saturn's Rings are computed from Bessel's data, except those for Bond's dusky ring.

The Tables for the eclipses of the sun are adapted to the modification of Bessel's formulæ, suggested by T. Henry Safford, jr. The formulæ are given in Peirce's *Spherical Astronomy* and Chauvenet's *Spherical and Practical Astronomy*, Vol. I.

# APPENDIX.

The elements for occultations of stars by the moon are adapted to BESSEL's method in the *Astronomische Nachrichten*, Vol. VII., and the *Berliner Astronomisches Jahrbuch* for 1831. The formulæ are also to be found in CHAUVENET's *Astronomy.*

The intervals of original computation have in all cases been made sufficiently small to authorize the use of the differences as a check of the accuracy of the work. The results have also been tested, in various portions, by means of duplicate computations. The proofs from the stereotype plates have been thoroughly examined by an independent series of differences. And it is believed that, in every respect, that system has been adopted in which accuracy was most likely to be secured.

The principal computations of the Ephemeris have been distributed in the following manner:

The Sun has been computed by Mr. EASTWOOD; the Moon's longitude, latitude, semidiameter and horizontal parallax by Prof. KEITH, right ascension and declination by Prof. VAN VLECK, and culminations by Prof. RUNKLE; the lunar distances by Mr. W. B. OLIVER; Mercury and Venus by Mr. AUSTIN; Mars and Uranus by Mr. FERREL; Jupiter and Jupiter's Satellites by Prof. KENDALL; Saturn by Prof. VAN VLECK; and Neptune by Mr. WIESSNER. The fixed stars and the general constants for their reduction have been prepared by Mr. LOOMIS and Mr. EASTWOOD, under the direction of the Superintendent; and the occultations by Mr. DOWNES assisted by Mr. WIESSNER. The eclipses have been computed and the charts projected by Mr. HILL. The positions of observatories was compiled by Dr. B. A. GOULD, and revised by him for the volume for 1870.

# TABLE I.

### TABLE SHOWING THE CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

| Approximate Interval. | | Difference of the Proportional Logarithms in the Ephemeris. | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 | 46 | 48 | 50 | 52 |
| h m | h m | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s |
| 0 0 | 3 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 10 | 2 50 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 0 20 | 2 40 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 |
| 0 30 | 2 30 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 7 | 7 | 7 | 8 | 8 | 8 | 9 | 9 |
| 0 40 | 2 20 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 10 | 11 | 11 |
| 0 50 | 2 10 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 12 | 12 | 13 | 13 |
| 1 0 | 2 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 12 | 12 | 13 | 13 | 14 | 14 |
| 1 10 | 1 50 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 8 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 12 | 13 | 14 | 14 | 15 | 15 |
| 1 20 | 1 40 | 1 | 1 | 2 | 3 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 7 | 8 | 9 | 9 | 10 | 10 | 11 | 12 | 12 | 13 | 14 | 14 | 15 | 15 | 16 |
| 1 30 | 1 30 | 1 | 1 | 2 | 3 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 12 | 13 | 14 | 14 | 15 | 16 | 16 |

| | | Difference of the Proportional Logarithms in the Ephemeris. | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 54 | 56 | 58 | 60 | 62 | 64 | 66 | 68 | 70 | 72 | 74 | 76 | 78 | 80 | 82 | 84 | 86 | 88 | 90 | 92 | 94 | 96 | 98 | 100 | 102 |
| h m | h m | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s |
| 0 0 | 3 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 10 | 2 50 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 |
| 0 20 | 2 40 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 13 |
| 0 30 | 2 30 | 9 | 10 | 10 | 10 | 11 | 11 | 12 | 12 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 18 |
| 0 40 | 2 20 | 12 | 12 | 13 | 13 | 13 | 14 | 14 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 21 | 21 | 22 | 22 |
| 0 50 | 2 10 | 14 | 14 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 18 | 19 | 19 | 20 | 20 | 21 | 21 | 22 | 22 | 22 | 23 | 23 | 24 | 24 | 25 | 26 |
| 1 0 | 2 0 | 15 | 16 | 16 | 17 | 17 | 18 | 18 | 19 | 19 | 20 | 21 | 21 | 22 | 22 | 23 | 23 | 24 | 24 | 25 | 25 | 26 | 27 | 27 | 28 | 28 |
| 1 10 | 1 50 | 16 | 17 | 17 | 18 | 18 | 19 | 19 | 20 | 21 | 21 | 22 | 22 | 23 | 24 | 24 | 25 | 25 | 26 | 27 | 27 | 28 | 28 | 29 | 30 | 30 |
| 1 20 | 1 40 | 17 | 17 | 18 | 19 | 19 | 20 | 20 | 21 | 21 | 22 | 23 | 23 | 24 | 25 | 25 | 26 | 26 | 27 | 28 | 28 | 29 | 29 | 30 | 31 | 31 |
| 1 30 | 1 30 | 17 | 18 | 18 | 19 | 19 | 20 | 21 | 21 | 22 | 23 | 23 | 24 | 24 | 25 | 25 | 26 | 27 | 27 | 28 | 29 | 29 | 30 | 31 | 31 | 32 |

| | | Difference of the Proportional Logarithms in the Ephemeris. | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 104 | 106 | 108 | 110 | 112 | 114 | 116 | 118 | 120 | 122 | 124 | 126 | 128 | 130 | 132 | 134 | 136 | 138 |
| h m | h m | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s |
| 0 0 | 3 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 10 | 2 50 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 |
| 0 20 | 2 40 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 |
| 0 30 | 2 30 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 22 | 22 | 22 | 23 | 23 | 24 | 24 |
| 0 40 | 2 20 | 22 | 23 | 23 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 27 | 27 | 28 | 28 | 28 | 29 | 29 | 30 |
| 0 50 | 2 10 | 26 | 26 | 27 | 27 | 28 | 29 | 29 | 29 | 30 | 30 | 31 | 31 | 32 | 32 | 33 | 33 | 34 | 34 |
| 1 0 | 2 0 | 29 | 29 | 30 | 30 | 31 | 31 | 32 | 33 | 33 | 34 | 34 | 35 | 35 | 36 | 37 | 37 | 38 | 38 |
| 1 10 | 1 50 | 31 | 31 | 32 | 32 | 33 | 34 | 34 | 35 | 35 | 36 | 37 | 37 | 38 | 38 | 39 | 40 | 40 | 41 |
| 1 20 | 1 40 | 32 | 33 | 33 | 34 | 34 | 35 | 35 | 36 | 37 | 38 | 38 | 39 | 39 | 40 | 41 | 41 | 42 | 42 |
| 1 30 | 1 30 | 32 | 33 | 34 | 34 | 35 | 35 | 36 | 36 | 37 | 38 | 39 | 39 | 40 | 40 | 41 | 42 | 42 | 43 |

**The Correction is to be *added* to the approximate Greenwich Time when the Proportional Logarithms in the Ephemeris are *decreasing*, and *subtracted* when they are *increasing*.**

# TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

## TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

| Sidereal. | $0^{\mathrm{h.}}$ | $1^{\mathrm{h.}}$ | $2^{\mathrm{h.}}$ | $3^{\mathrm{h.}}$ | $4^{\mathrm{h.}}$ | $5^{\mathrm{h.}}$ | $6^{\mathrm{h.}}$ | $7^{\mathrm{h.}}$ | For Seconds. | |
|---|---|---|---|---|---|---|---|---|---|---|
| m | m s | m s | m s | m s | m s | m s | m s | m s | s | s |
| 0 | 0 0.000 | 0 9.830 | 0 19.659 | 0 29.489 | 0 39.318 | 0 49.148 | 0 58.977 | 1 8.807 | | |
| 1 | 0 0.164 | 0 9.993 | 0 19.823 | 0 29.653 | 0 39.482 | 0 49.312 | 0 59.141 | 1 8.971 | 1 | 0.003 |
| 2 | 0 0.328 | 0 10.157 | 0 19.987 | 0 29.816 | 0 39.646 | 0 49.475 | 0 59.305 | 1 9.135 | 2 | .005 |
| 3 | 0 0.491 | 0 10.321 | 0 20.151 | 0 29.980 | 0 39.810 | 0 49.639 | 0 59.469 | 1 9.298 | 3 | .008 |
| 4 | 0 0.655 | 0 10.485 | 0 20.314 | 0 30.144 | 0 39.974 | 0 49.803 | 0 59.633 | 1 9.462 | 4 | .011 |
| 5 | 0 0.819 | 0 10.649 | 0 20.478 | 0 30.308 | 0 40.137 | 0 49.967 | 0 59.796 | 1 9.626 | 5 | .014 |
| 6 | 0 0.983 | 0 10.813 | 0 20.642 | 0 30.472 | 0 40.301 | 0 50.131 | 0 59.960 | 1 9.790 | 6 | .016 |
| 7 | 0 1.147 | 0 10.976 | 0 20.806 | 0 30.635 | 0 40.465 | 0 50.295 | 1 0.124 | 1 9.954 | 7 | .019 |
| 8 | 0 1.311 | 0 11.140 | 0 20.970 | 0 30.799 | 0 40.629 | 0 50.458 | 1 0.288 | 1 10.118 | 8 | .022 |
| 9 | 0 1.474 | 0 11.304 | 0 21.134 | 0 30.963 | 0 40.793 | 0 50.622 | 1 0.452 | 1 10.281 | 9 | .025 |
| 10 | 0 1.638 | 0 11.468 | 0 21.297 | 0 31.127 | 0 40.956 | 0 50.786 | 1 0.616 | 1 10.445 | 10 | .027 |
| 11 | 0 1.802 | 0 11.632 | 0 21.461 | 0 31.291 | 0 41.120 | 0 50.950 | 1 0.779 | 1 10.609 | 11 | .030 |
| 12 | 0 1.966 | 0 11.795 | 0 21.625 | 0 31.455 | 0 41.284 | 0 51.114 | 1 0.943 | 1 10.773 | 12 | .033 |
| 13 | 0 2.130 | 0 11.959 | 0 21.789 | 0 31.618 | 0 41.448 | 0 51.278 | 1 1.107 | 1 10.937 | 13 | .035 |
| 14 | 0 2.294 | 0 12.123 | 0 21.953 | 0 31.782 | 0 41.612 | 0 51.441 | 1 1.271 | 1 11.100 | 14 | .038 |
| 15 | 0 2.457 | 0 12.287 | 0 22.117 | 0 31.946 | 0 41.776 | 0 51.605 | 1 1.435 | 1 11.264 | 15 | .041 |
| 16 | 0 2.621 | 0 12.451 | 0 22.280 | 0 32.110 | 0 41.939 | 0 51.769 | 1 1.599 | 1 11.428 | 16 | .044 |
| 17 | 0 2.785 | 0 12.615 | 0 22.444 | 0 32.274 | 0 42.103 | 0 51.933 | 1 1.762 | 1 11.592 | 17 | .046 |
| 18 | 0 2.949 | 0 12.778 | 0 22.608 | 0 32.438 | 0 42.267 | 0 52.097 | 1 1.926 | 1 11.756 | 18 | .049 |
| 19 | 0 3.113 | 0 12.942 | 0 22.772 | 0 32.601 | 0 42.431 | 0 52.260 | 1 2.090 | 1 11.920 | 19 | .052 |
| 20 | 0 3.277 | 0 13.106 | 0 22.936 | 0 32.765 | 0 42.595 | 0 52.424 | 1 2.254 | 1 12.083 | 20 | .055 |
| 21 | 0 3.440 | 0 13.270 | 0 23.099 | 0 32.929 | 0 42.759 | 0 52.588 | 1 2.418 | 1 12.247 | 21 | .057 |
| 22 | 0 3.604 | 0 13.434 | 0 23.263 | 0 33.093 | 0 42.922 | 0 52.752 | 1 2.582 | 1 12.411 | 22 | .060 |
| 23 | 0 3.768 | 0 13.598 | 0 23.427 | 0 33.257 | 0 43.086 | 0 52.916 | 1 2.745 | 1 12.575 | 23 | .063 |
| 24 | 0 3.932 | 0 13.761 | 0 23.591 | 0 33.420 | 0 43.250 | 0 53.080 | 1 2.909 | 1 12.739 | 24 | .066 |
| 25 | 0 4.096 | 0 13.925 | 0 23.755 | 0 33.584 | 0 43.414 | 0 53.243 | 1 3.073 | 1 12.903 | 25 | .068 |
| 26 | 0 4.259 | 0 14.089 | 0 23.919 | 0 33.748 | 0 43.578 | 0 53.407 | 1 3.237 | 1 13.066 | 26 | .071 |
| 27 | 0 4.423 | 0 14.253 | 0 24.082 | 0 33.912 | 0 43.742 | 0 53.571 | 1 3.401 | 1 13.230 | 27 | .074 |
| 28 | 0 4.587 | 0 14.417 | 0 24.246 | 0 34.076 | 0 43.905 | 0 53.735 | 1 3.564 | 1 13.394 | 28 | .076 |
| 29 | 0 4.751 | 0 14.581 | 0 24.410 | 0 34.240 | 0 44.069 | 0 53.899 | 1 3.728 | 1 13.558 | 29 | .079 |
| 30 | 0 4.915 | 0 14.744 | 0 24.574 | 0 34.403 | 0 44.233 | 0 54.063 | 1 3.892 | 1 13.722 | 30 | .082 |
| 31 | 0 5.079 | 0 14.908 | 0 24.738 | 0 34.567 | 0 44.397 | 0 54.226 | 1 4.056 | 1 13.886 | 31 | .085 |
| 32 | 0 5.242 | 0 15.072 | 0 24.902 | 0 34.731 | 0 44.561 | 0 54.390 | 1 4.220 | 1 14.049 | 32 | .087 |
| 33 | 0 5.406 | 0 15.236 | 0 25.065 | 0 34.895 | 0 44.724 | 0 54.554 | 1 4.384 | 1 14.213 | 33 | .090 |
| 34 | 0 5.570 | 0 15.400 | 0 25.229 | 0 35.059 | 0 44.888 | 0 54.718 | 1 4.547 | 1 14.377 | 34 | .093 |
| 35 | 0 5 734 | 0 15.563 | 0 25.393 | 0 35.223 | 0 45.052 | 0 54.882 | 1 4.711 | 1 14.541 | 35 | .096 |
| 36 | 0 5.898 | 0 15.727 | 0 25.557 | 0 35.386 | 0 45.216 | 0 55.046 | 1 4.875 | 1 14.705 | 36 | .098 |
| 37 | 0 6.062 | 0 15.891 | 0 25.721 | 0 35.550 | 0 45.380 | 0 55.209 | 1 5.039 | 1 14.868 | 37 | .101 |
| 38 | 0 6.225 | 0 16.055 | 0 25.885 | 0 35.714 | 0 45.544 | 0 55.373 | 1 5.203 | 1 15.032 | 38 | .104 |
| 39 | 0 6.389 | 0 16.219 | 0 26.048 | 0 35.878 | 0 45.707 | 0 55.537 | 1 5.367 | 1 15.196 | 39 | .106 |
| 40 | 0 6.553 | 0 16.383 | 0 26.212 | 0 36.042 | 0 45.871 | 0 55.701 | 1 5.530 | 1 15.360 | 40 | .109 |
| 41 | 0 6.717 | 0 16.546 | 0 26.376 | 0 36.206 | 0 46.035 | 0 55.865 | 1 5.694 | 1 15.524 | 41 | .112 |
| 42 | 0 6.881 | 0 16.710 | 0 26.540 | 0 36.369 | 0 46.199 | 0 56.028 | 1 5.858 | 1 15.688 | 42 | .115 |
| 43 | 0 7.045 | 0 16.874 | 0 26.704 | 0 36.533 | 0 46.363 | 0 56.192 | 1 6.022 | 1 15.851 | 43 | .117 |
| 44 | 0 7.208 | 0 17.038 | 0 26.867 | 0 36.697 | 0 46.527 | 0 56.356 | 1 6.186 | 1 16.015 | 44 | .120 |
| 45 | 0 7.372 | 0 17.202 | 0 27.031 | 0 36.861 | 0 46.690 | 0 56.520 | 1 6.350 | 1 16.179 | 45 | .123 |
| 46 | 0 7.536 | 0 17.366 | 0 27.195 | 0 37.025 | 0 46.854 | 0 56.684 | 1 6.513 | 1 16.343 | 46 | .126 |
| 47 | 0 7.700 | 0 17.529 | 0 27.359 | 0 37.188 | 0 47.018 | 0 56.848 | 1 6.677 | 1 16.507 | 47 | .128 |
| 48 | 0 7.864 | 0 17.693 | 0 27.523 | 0 37.352 | 0 47.182 | 0 57.011 | 1 6.841 | 1 16.671 | 48 | .131 |
| 49 | 0 8.027 | 0 17.857 | 0 27.687 | 0 37.516 | 0 47.346 | 0 57.175 | 1 7.005 | 1 16.834 | 49 | .134 |
| 50 | 0 8.191 | 0 18.021 | 0 27.850 | 0 37.680 | 0 47.510 | 0 57.339 | 1 7.169 | 1 16.998 | 50 | .137 |
| 51 | 0 8.355 | 0 18.185 | 0 28.014 | 0 37.844 | 0 47.673 | 0 57.503 | 1 7.332 | 1 17.162 | 51 | .139 |
| 52 | 0 8.519 | 0 18.349 | 0 28.178 | 0 38.008 | 0 47.837 | 0 57.667 | 1 7.496 | 1 17.326 | 52 | .142 |
| 53 | 0 8.683 | 0 18.512 | 0 28.342 | 0 38.171 | 0 48.001 | 0 57.831 | 1 7.660 | 1 17.490 | 53 | .145 |
| 54 | 0 8.847 | 0 18.676 | 0 28.506 | 0 38.335 | 0 48.165 | 0 57.994 | 1 7.824 | 1 17.654 | 54 | .147 |
| 55 | 0 9.010 | 0 18.840 | 0 28.670 | 0 38.499 | 0 48.329 | 0 58.158 | 1 7.988 | 1 17.817 | 55 | .150 |
| 56 | 0 9.174 | 0 19.004 | 0 28.833 | 0 38.663 | 0 48.492 | 0 58.322 | 1 8.152 | 1 17.981 | 56 | .153 |
| 57 | 0 9.338 | 0 19.168 | 0 28.997 | 0 38.827 | 0 48.656 | 0 58.486 | 1 8.315 | 1 18.145 | 57 | .156 |
| 58 | 0 9.502 | 0 19.331 | 0 29.161 | 0 38.991 | 0 48.820 | 0 58.650 | 1 8.479 | 1 18.309 | 58 | .158 |
| 59 | 0 9.666 | 0 19.495 | 0 29.325 | 0 39.154 | 0 48.984 | 0 58.814 | 1 8.643 | 1 18.473 | 59 | 0.161 |

# TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

## TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

| Sidereal. | $8^{h.}$ | $9^{h.}$ | $10^{h.}$ | $11^{h.}$ | $12^{h.}$ | $13^{h.}$ | $14^{h.}$ | $15^{h.}$ | For Seconds. | |
|---|---|---|---|---|---|---|---|---|---|---|
| m | m s | m s | m s | m s | m s | m s | m s | m s | s | s |
| 0 | 1 18.636 | 1 28.466 | 1 38.296 | 1 48.125 | 1 57.955 | 2 7.784 | 2 17.614 | 2 27.443 | | |
| 1 | 1 18.800 | 1 28.630 | 1 38.459 | 1 48.289 | 1 58.119 | 2 7.948 | 2 17.778 | 2 27.607 | 1 | 0.003 |
| 2 | 1 18.964 | 1 28.794 | 1 38.623 | 1 48.453 | 1 58.282 | 2 8.112 | 2 17.941 | 2 27.771 | 2 | .005 |
| 3 | 1 19.128 | 1 28.958 | 1 38.787 | 1 48.617 | 1 58.446 | 2 8.276 | 2 18.105 | 2 27.935 | 3 | .008 |
| 4 | 1 19.292 | 1 29.121 | 1 38.951 | 1 48.780 | 1 58.610 | 2 8.440 | 2 18.269 | 2 28.099 | 4 | .011 |
| 5 | 1 19.456 | 1 29.285 | 1 39.115 | 1 48.944 | 1 58.774 | 2 8.603 | 2 18.433 | 2 28.263 | 5 | .014 |
| 6 | 1 19.619 | 1 29.449 | 1 39.279 | 1 49.108 | 1 58.938 | 2 8.767 | 2 18.597 | 2 28.426 | 6 | .016 |
| 7 | 1 19.783 | 1 29.613 | 1 39.442 | 1 49.272 | 1 59.101 | 2 8.931 | 2 18.761 | 2 28.590 | 7 | .019 |
| 8 | 1 19.947 | 1 29.777 | 1 39.606 | 1 49.436 | 1 59.265 | 2 9.095 | 2 18.924 | 2 28.754 | 8 | .022 |
| 9 | 1 20.111 | 1 29.940 | 1 39.770 | 1 49.600 | 1 59.429 | 2 9.259 | 2 19.088 | 2 28.918 | 9 | .025 |
| 10 | 1 20.275 | 1 30.104 | 1 39.934 | 1 49 763 | 1 59.593 | 2 9.423 | 2 19.252 | 2 29.082 | 10 | .027 |
| 11 | 1 20.439 | 1 30.268 | 1 40.098 | 1 49.927 | 1 59 757 | 2 9.586 | 2 19.416 | 2 29.245 | 11 | .030 |
| 12 | 1 20.602 | 1 30.432 | 1 40.261 | 1 50.091 | 1 59.921 | 2 9.750 | 2 19.580 | 2 29.409 | 12 | .033 |
| 13 | 1 20.766 | 1 30.596 | 1 40.425 | 1 50.255 | 2 0.084 | 2 9.914 | 2 19.744 | 2 29.573 | 13 | .035 |
| 14 | 1 20.930 | 1 30.760 | 1 40.589 | 1 50.419 | 2 0.248 | 2 10.078 | 2 19.907 | 2 29.737 | 14 | .038 |
| 15 | 1 21.094 | 1 30.923 | 1 40.753 | 1 50.583 | 2 0.412 | 2 10.242 | 2 20.071 | 2 29.901 | 15 | .041 |
| 16 | 1 21.258 | 1 31.087 | 1 40.917 | 1 50.746 | 2 0.576 | 2 10.405 | 2 20 235 | 2 30.065 | 16 | .044 |
| 17 | 1 21.422 | 1 31.251 | 1 41.081 | 1 50.910 | 2 0.740 | 2 10.569 | 2 20.399 | 2 30.228 | 17 | .046 |
| 18 | 1 21.585 | 1 31.415 | 1 41.244 | 1 51.074 | 2 0.904 | 2 10.733 | 2 20.563 | 2 30.392 | 18 | .049 |
| 19 | 1 21.749 | 1 31.579 | 1 41.408 | 1 51.238 | 2 1.067 | 2 10.897 | 2 20.727 | 2 30.556 | 19 | .052 |
| 20 | 1 21.913 | 1 31.743 | 1 41.572 | 1 51.402 | 2 1.231 | 2 11.061 | 2 20.890 | 2 30.720 | 20 | .055 |
| 21 | 1 22.077 | 1 31.906 | 1 41.736 | 1 51.565 | 2 1.395 | 2 11.225 | 2 21.054 | 2 30.884 | 21 | .057 |
| 22 | 1 22.241 | 1 32.070 | 1 41.900 | 1 51.729 | 2 1.559 | 2 11.388 | 2 21.218 | 2 31.048 | 22 | .060 |
| 23 | 1 22.404 | 1 32.234 | 1 42.064 | 1 51.893 | 2 1.723 | 2 11.552 | 2 21.382 | 2 31.211 | 23 | .063 |
| 24 | 1 22.568 | 1 32.398 | 1 42.227 | 1 52.057 | 2 1.887 | 2 11.716 | 2 21.546 | 2 31.375 | 24 | .066 |
| 25 | 1 22.732 | 1 32.562 | 1 42.391 | 1 52.221 | 2 2.050 | 2 11.880 | 2 21.709 | 2 31.539 | 25 | .068 |
| 26 | 1 22.896 | 1 32.726 | 1 42.555 | 1 52.385 | 2 2.214 | 2 12.044 | 2 21.873 | 2 31.703 | 26 | .071 |
| 27 | 1 23.060 | 1 32.889 | 1 42.719 | 1 52.548 | 2 2.378 | 2 12.208 | 2 22.037 | 2 31.867 | 27 | .074 |
| 28 | 1 23.224 | 1 33.053 | 1 42.883 | 1 52.712 | 2 2.542 | 2 12.371 | 2 22.201 | 2 32.031 | 28 | .076 |
| 29 | 1 23.387 | 1 33.217 | 1 43.047 | 1 52.876 | 2 2.706 | 2 12.535 | 2 22.365 | 2 32.194 | 29 | .079 |
| 30 | 1 23.551 | 1 33.381 | 1 43.210 | 1 53.040 | 2 2.869 | 2 12.699 | 2 22.529 | 2 32.358 | 30 | .082 |
| 31 | 1 23.715 | 1 33.545 | 1 43.374 | 1 53.204 | 2 3.033 | 2 12.863 | 2 22.692 | 2 32.522 | 31 | .085 |
| 32 | 1 23.879 | 1 33.708 | 1 43.538 | 1 53.368 | 2 3.197 | 2 13.027 | 2 22.856 | 2 32.686 | 32 | .087 |
| 33 | 1 24.043 | 1 33.872 | 1 43.702 | 1 53.531 | 2 3.361 | 2 13.191 | 2 23.020 | 2 32.850 | 33 | .090 |
| 34 | 1 24.207 | 1 34.036 | 1 43.866 | 1 53.695 | 2 3.525 | 2 13.354 | 2 23.184 | 2 33.013 | 34 | .093 |
| 35 | 1 24.370 | 1 34.200 | 1 44.029 | 1 53.859 | 2 3.689 | 2 13.518 | 2 23.348 | 2 33.177 | 35 | .096 |
| 36 | 1 24.534 | 1 34.364 | 1 44.193 | 1 54.023 | 2 3.852 | 2 13.682 | 2 23.512 | 2 33.341 | 36 | .098 |
| 37 | 1 24.698 | 1 34.528 | 1 44.357 | 1 54.187 | 2 4.016 | 2 13.846 | 2 23.675 | 2 33.505 | 37 | ·101 |
| 38 | 1 24.862 | 1 34.691 | 1 44.521 | 1 54.351 | 2 4.180 | 2 14.010 | 2 23.839 | 2 33.669 | 38 | .104 |
| 39 | 1 25.026 | 1 34.855 | 1 44.685 | 1 54.514 | 2 4.344 | 2 14.173 | 2 24.003 | 2 33.833 | 39 | .106 |
| 40 | 1 25.190 | 1 35.019 | 1 44.849 | 1 54.678 | 2 4.508 | 2 14.337 | 2 24.167 | 2 33.996 | 40 | .109 |
| 41 | 1 25.353 | 1 35.183 | 1 45.012 | 1 54.842 | 2 4.672 | 2 14.501 | 2 24.331 | 2 34.160 | 41 | .112 |
| 42 | 1 25.517 | 1 35.347 | 1 45.176 | 1 55.006 | 2 4.835 | 2 14.665 | 2 24.495 | 2 34.324 | 42 | .115 |
| 43 | 1 25.681 | 1 35.511 | 1 45.340 | 1 55.170 | 2 4.999 | 2 14.829 | 2 24.658 | 2 34.488 | 43 | .117 |
| 44 | 1 25.845 | 1 35.674 | 1 45.504 | 1 55.333 | 2 5.163 | 2 14.993 | 2 24.822 | 2 34.652 | 44 | .120 |
| 45 | 1 26.009 | 1 35.838 | 1 45.668 | 1 55.497 | 2 5.327 | 2 15.156 | 2 24.986 | 2 34.816 | 45 | .123 |
| 46 | 1 26.172 | 1 36.002 | 1 45.832 | 1 55.661 | 2 5.491 | 2 15.320 | 2 25.150 | 2 34.979 | 46 | .126 |
| 47 | 1 26.336 | 1 36.166 | 1 45.995 | 1 55.825 | 2 5.655 | 2 15.484 | 2 25.314 | 2 35.143 | 47 | .128 |
| 48 | 1 26.500 | 1 36.330 | 1 46.159 | 1 55.989 | 2 5.818 | 2 15.648 | 2 25.477 | 2 35.307 | 48 | .131 |
| 49 | 1 26.664 | 1 36.493 | 1 46.323 | 1 56.153 | 2 5.982 | 2 15.812 | 2 25.641 | 2 35.471 | 49 | .134 |
| 50 | 1 26.828 | 1 36.657 | 1 46.487 | 1 56.316 | 2 6.146 | 2 15.976 | 2 25.805 | 2 35.635 | 50 | .137 |
| 51 | 1 26.992 | 1 36.821 | 1 46.651 | 1 56.480 | 2 6.310 | 2 16.139 | 2 25.969 | 2 35.798 | 51 | .139 |
| 52 | 1 27.155 | 1 36.985 | 1 46.815 | 1 56.644 | 2 6.474 | 2 16.303 | 2 26.133 | 2 35.962 | 52 | .142 |
| 53 | 1 27.319 | 1 37.149 | 1 46.978 | 1 56.808 | 2 6.637 | 2 16.467 | 2 26.297 | 2 36.126 | 53 | .145 |
| 54 | 1 27.483 | 1 37.313 | 1 47.142 | 1 56.972 | 2 6.801 | 2 16.631 | 2 26.460 | 2 36.290 | 54 | .147 |
| 55 | 1 27.647 | 1 37.476 | 1 47.306 | 1 57.136 | 2 6.965 | 2 16.795 | 2 26.624 | 2 36.454 | 55 | .150 |
| 56 | 1 27.811 | 1 37.640 | 1 47.470 | 1 57.299 | 2 7.129 | 2 16.959 | 2 26.788 | 2 36.618 | 56 | .153 |
| 57 | 1 27.975 | 1 37.804 | 1 47.634 | 1 57.463 | 2 7.293 | 2 17.122 | 2 26.952 | 2 36.781 | 57 | .156 |
| 58 | 1 28.138 | 1 37.968 | 1 47.797 | 1 57.627 | 2 7.457 | 2 17.286 | 2 27.116 | 2 36.945 | 58 | .158 |
| 59 | 1 28.302 | 1 38.132 | 1 47.961 | 1 57.791 | 2 7.620 | 2 17.450 | 2 27.280 | 2 37.109 | 59 | 0.161 |

# TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

**TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.**

| Sidereal. | $16^{h.}$ | $17^{h.}$ | $18^{h.}$ | $19^{h.}$ | $20^{h.}$ | $21^{h.}$ | $22^{h.}$ | $23^{h.}$ | For Seconds. | |
|---|---|---|---|---|---|---|---|---|---|---|
| m | m s | m s | m s | m s | m s | m s | m s | m s | s | s |
| 0 | 2 37.273 | 2 47.102 | 2 56.932 | 3 6.762 | 3 16.591 | 3 26.421 | 3 36.250 | 3 46.080 | | |
| 1 | 2 37.437 | 2 47.266 | 2 57.096 | 3 6.925 | 3 16.755 | 3 26.585 | 3 36.414 | 3 46.244 | 1 | 0.003 |
| 2 | 2 37.601 | 2 47.430 | 2 57.260 | 3 7.089 | 3 16.919 | 3 26.748 | 3 36.578 | 3 46.407 | 2 | .005 |
| 3 | 2 37.764 | 2 47.594 | 2 57.424 | 3 7.253 | 3 17.083 | 3 26.912 | 3 36.742 | 3 46.571 | 3 | .008 |
| 4 | 2 37.928 | 2 47.758 | 2 57.587 | 3 7.417 | 3 17.246 | 3 27.076 | 3 36.906 | 3 46.735 | 4 | .011 |
| 5 | 2 38.092 | 2 47.922 | 2 57.751 | 3 7.581 | 3 17.410 | 3 27.240 | 3 37.069 | 3 46·899 | 5 | .014 |
| 6 | 2 38.256 | 2 48.085 | 2 57.915 | 3 7.745 | 3 17.574 | 3 27.404 | 3 37.233 | 3 47.063 | 6 | .016 |
| 7 | 2 38.420 | 2 48.249 | 2 58.079 | 3 7.908 | 3 17.738 | 3 27.568 | 3 37.397 | 3 47.227 | 7 | .019 |
| 8 | 2 38.584 | 2 48.413 | 2 58.243 | 3 8.072 | 3 17.902 | 3 27.731 | 3 37.561 | 3 47.390 | 8 | .022 |
| 9 | 2 38.747 | 2 48.577 | 2 58.406 | 3 8.236 | 3 18.066 | 3 27.895 | 3 37.725 | 3 47.554 | 9 | .025 |
| 10 | 2 38.911 | 2 48.741 | 2 58.570 | 3 8.400 | 3 18.229 | 3 28.059 | 3 37.889 | 3 47.718 | 10 | .027 |
| 11 | 2 39.075 | 2 48.905 | 2 58.734 | 3 8.564 | 3 18.393 | 3 28.223 | 3 38.052 | 3 47.882 | 11 | .030 |
| 12 | 2 39.239 | 2 49.068 | 2 58.898 | 3 8.728 | 3 18.557 | 3 28.387 | 3 38.216 | 3 48.046 | 12 | .033 |
| 13 | 2 39.403 | 2 49.232 | 2 59.062 | 3 8.891 | 3 18.721 | 3 28.550 | 3 38.380 | 3 48.210 | 13 | .035 |
| 14 | 2 39.566 | 2 49.396 | 2 59.226 | 3 9.055 | 3 18.885 | 3 28.714 | 3 38.544 | 3 48.373 | 14 | .038 |
| 15 | 2 39.730 | 2 49.560 | 2 59.389 | 3 9.219 | 3 19.049 | 3 28.878 | 3 38.708 | 3 48.537 | 15 | .041 |
| 16 | 2 39.894 | 2 49.724 | 2 59.553 | 3 9.383 | 3 19.212 | 3 29.042 | 3 38.871 | 3 48.701 | 16 | .044 |
| 17 | 2 40.058 | 2 49.888 | 2 59.717 | 3 9.547 | 3 19 376 | 3 29.206 | 3 39.035 | 3 48.865 | 17 | .046 |
| 18 | 2 40.222 | 2 50.051 | 2 59.881 | 3 9.710 | 3 19.540 | 3 29.370 | 3 39.199 | 3 49.029 | 18 | .049 |
| 19 | 2 40.386 | 2 50.215 | 3 0.045 | 3 9.874 | 3 19.704 | 3 29.533 | 3 39.363 | 3 49.193 | 19 | .052 |
| 20 | 2 40.549 | 2 50.379 | 3 0.209 | 3 10.038 | 3 19.868 | 3 29.697 | 3 39.527 | 3 49.356 | 20 | .055 |
| 21 | 2 40.713 | 2 50.543 | 3 0.372 | 3 10.202 | 3 20.032 | 3 29.861 | 3 39.691 | 3 49.520 | 21 | .057 |
| 22 | 2 40.877 | 2 50.707 | 3 0.536 | 3 10.366 | 3 20.195 | 3 30.025 | 3 39.854 | 3 49.684 | 22 | .060 |
| 23 | 2 41.041 | 2 50.870 | 3 0.700 | 3 10.530 | 3 20.359 | 3 30.189 | 3 40.018 | 3 49.848 | 23 | .063 |
| 24 | 2 41.205 | 2 51.034 | 3 0.864 | 3 10.693 | 3 20.523 | 3 30.353 | 3 40.182 | 3 50.012 | 24 | .066 |
| 25 | 2 41.369 | 2 51.198 | 3 1.028 | 3 10.857 | 3 20.687 | 3 30.516 | 3 40.346 | 3 50.175 | 25 | .068 |
| 26 | 2 41.532 | 2 51.362 | 3 1.192 | 3 11.021 | 3 20.851 | 3 30.680 | 3 40.510 | 3 50.339 | 26 | .071 |
| 27 | 2 41.696 | 2 51.526 | 3 1.355 | 3 11.185 | 3 21.014 | 3 30.844 | 3 40.674 | 3 50.503 | 27 | .074 |
| 28 | 2 41.860 | 2 51.690 | 3 1.519 | 3 11.349 | 3 21.178 | 3 31.008 | 3 40.837 | 3 50.667 | 28 | .076 |
| 29 | 2 42.024 | 2 51.853 | 3 1.683 | 3 11.513 | 3 21.342 | 3 31.172 | 3 41.001 | 3 50.831 | 29 | .079 |
| 30 | 2 42.188 | 2 52.017 | 3 1.847 | 3 11.676 | 3 21.506 | 3 31.336 | 3 41.165 | 3 50.995 | 30 | .082 |
| 31 | 2 42.352 | 2 52.181 | 3 2.011 | 3 11.840 | 3 21.670 | 3 31.499 | 3 41.329 | 3 51.158 | 31 | .085 |
| 32 | 2 42.515 | 2 52.345 | 3 2.174 | 3 12.004 | 3 21.834 | 3 31.663 | 3 41.493 | 3 51.322 | 32 | .087 |
| 33 | 2 42.679 | 2 52.509 | 3 2.338 | 3 12.168 | 3 21.997 | 3 31.827 | 3 41.657 | 3 51.486 | 33 | .090 |
| 34 | 2 42.843 | 2 52.673 | 3 2.502 | 3 12.332 | 3 22.161 | 3 31.991 | 3 41.820 | 3 51.650 | 34 | .093 |
| 35 | 2 43.007 | 2 52.836 | 3 2.666 | 3 12.496 | 3 22.325 | 3 32.155 | 3 41.984 | 3 51.814 | 35 | .096 |
| 36 | 2 43.171 | 2 53.000 | 3 2.830 | 3 12.659 | 3 22.489 | 3 32.318 | 3 42.148 | 3 51.978 | 36 | .098 |
| 37 | 2 43.334 | 2 53.164 | 3 2.994 | 3 12.823 | 3 22.653 | 3 32.482 | 3 42.312 | 3 52.141 | 37 | .101 |
| 38 | 2 43.498 | 2 53.328 | 3 3.157 | 3 12.987 | 3 22.817 | 3 32.646 | 3 42.476 | 3 52.305 | 38 | .104 |
| 39 | 2 43.662 | 2 53.492 | 3 3.321 | 3 13.151 | 3 22.980 | 3 32.810 | 3 42.639 | 3 52.469 | 39 | .106 |
| 40 | 2 43.826 | 2 53.656 | 3 3.485 | 3 13.315 | 3 23.144 | 3 32.974 | 3 42.803 | 3 52.633 | 40 | .109 |
| 41 | 2 43.990 | 2 53.819 | 3 3.649 | 3 13.478 | 3 23.308 | 3 33.138 | 3 42.967 | 3 52.797 | 41 | .112 |
| 42 | 2 44.154 | 2 53.983 | 3 3.813 | 3 13.642 | 3 23.472 | 3 33.301 | 3 43.131 | 3 52.961 | 42 | .115 |
| 43 | 2 44.317 | 2 54.147 | 3 3.977 | 3 13.806 | 3 23.636 | 3 33.465 | 3 43.295 | 3 53.124 | 43 | .117 |
| 44 | 2 44.481 | 2 54.311 | 3 4 140 | 3 13.970 | 3 23.800 | 3 33.629 | 3 43.459 | 3 53.288 | 44 | .120 |
| 45 | 2 44.645 | 2 54.475 | 3 4.304 | 3 14.134 | 3 23.963 | 3 33.793 | 3 43.622 | 3 53.452 | 45 | .123 |
| 46 | 2 44.809 | 2 54.638 | 3 4.468 | 3 14.298 | 3 24.127 | 3 33.957 | 3 43.786 | 3 53.616 | 46 | .126 |
| 47 | 2 44.973 | 2 54.802 | 3 4.632 | 3 14.461 | 3 24.291 | 3 34.121 | 3 43.950 | 3 53.780 | 47 | .128 |
| 48 | 2 45.137 | 2 54.966 | 3 4.796 | 3 14.625 | 3 24.455 | 3 34.284 | 3 44.114 | 3 53.943 | 48 | .131 |
| 49 | 2 45.300 | 2 55.130 | 3 4.960 | 3 14.789 | 3 24.619 | 3 34.448 | 3 44.278 | 3 54.107 | 49 | .134 |
| 50 | 2 45.464 | 2 55.294 | 3 5.123 | 3 14.953 | 3 24.782 | 3 34.612 | 3 44.442 | 3 54.271 | 50 | .137 |
| 51 | 2 45.628 | 2 55.458 | 3 5.287 | 3 15.117 | 3 24.946 | 3 34.776 | 3 44.605 | 3 54.435 | 51 | .139 |
| 52 | 2 45.792 | 2 55.621 | 3 5.451 | 3 15.281 | 3 25.110 | 3 34.940 | 3 44.769 | 3 54.599 | 52 | .142 |
| 53 | 2 45.956 | 2 55.785 | 3 5.615 | 3 15.444 | 3 25.274 | 3 35.104 | 3 44.933 | 3 54.763 | 53 | .145 |
| 54 | 2 46.120 | 2 55.949 | 3 5.779 | 3 15.608 | 3 25.438 | 3 35.267 | 3 45.097 | 3 54.926 | 54 | .147 |
| 55 | 2 46.283 | 2 56.113 | 3 5.942 | 3 15.772 | 3 25.602 | 3 35.431 | 3 45.261 | 3 55.090 | 55 | .150 |
| 56 | 2 46.447 | 2 56.277 | 3 6.106 | 3 15.936 | 3 25.765 | 3 35.595 | 3 45.425 | 3 55.254 | 56 | .153 |
| 57 | 2 46.611 | 2 56.441 | 3 6.270 | 3 16.100 | 3 25.929 | 3 35.759 | 3 45.588 | 3 55.418 | 57 | .156 |
| 58 | 2 46.775 | 2 56.604 | 3 6.434 | 3 16.264 | 3 26.093 | 3 35.923 | 3 45.752 | 3 55.582 | 58 | .158 |
| 59 | 2 46.939 | 2 56.768 | 3 6.598 | 3 16.427 | 3 26.257 | 3 36.086 | 3 45.916 | 3 55.746 | 59 | 0.161 |

# TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

## TO BE ADDED TO A MEAN TIME INTERVAL.

| Mean Solar. | $0^{\text{h.}}$ | | $1^{\text{h.}}$ | | $2^{\text{h.}}$ | | $3^{\text{h.}}$ | | $4^{\text{h.}}$ | | $5^{\text{h.}}$ | | $6^{\text{h.}}$ | | $7^{\text{h.}}$ | | For Seconds. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| m | m | s | m | s | m | s | m | s | m | s | m | s | m | s | m | s | s | s |
| 0 | 0 | 0.000 | 0 | 9.856 | 0 | 19.713 | 0 | 29.569 | 0 | 39.426 | 0 | 49.282 | 0 | 59.139 | 1 | 8.995 | | |
| 1 | 0 | 0.164 | 0 | 10.021 | 0 | 19.877 | 0 | 29.734 | 0 | 39.590 | 0 | 49.447 | 0 | 59.303 | 1 | 9.160 | 1 | 0.003 |
| 2 | 0 | 0.329 | 0 | 10.185 | 0 | 20.041 | 0 | 29.898 | 0 | 39.754 | 0 | 49.611 | 0 | 59.467 | 1 | 9.324 | 2 | .005 |
| 3 | 0 | 0.493 | 0 | 10.349 | 0 | 20.206 | 0 | 30.062 | 0 | 39.919 | 0 | 49.775 | 0 | 59.632 | 1 | 9.488 | 3 | .008 |
| 4 | 0 | 0.657 | 0 | 10.514 | 0 | 20.370 | 0 | 30.227 | 0 | 40.083 | 0 | 49.939 | 0 | 59.796 | 1 | 9.652 | 4 | .011 |
| 5 | 0 | 0.821 | 0 | 10.678 | 0 | 20.534 | 0 | 30.391 | 0 | 40.247 | 0 | 50.104 | 0 | 59.960 | 1 | 9.817 | 5 | .014 |
| 6 | 0 | 0.986 | 0 | 10.842 | 0 | 20.699 | 0 | 30.555 | 0 | 40.412 | 0 | 50.268 | 1 | 0.124 | 1 | 9.981 | 6 | .016 |
| 7 | 0 | 1.150 | 0 | 11.006 | 0 | 20.863 | 0 | 30.719 | 0 | 40.576 | 0 | 50.432 | 1 | 0.289 | 1 | 10.145 | 7 | .019 |
| 8 | 0 | 1.314 | 0 | 11.171 | 0 | 21.027 | 0 | 30.884 | 0 | 40.740 | 0 | 50.597 | 1 | 0.453 | 1 | 10.310 | 8 | .022 |
| 9 | 0 | 1.478 | 0 | 11.335 | 0 | 21.191 | 0 | 31.048 | 0 | 40.904 | 0 | 50.761 | 1 | 0.617 | 1 | 10.474 | 9 | .025 |
| 10 | 0 | 1.643 | 0 | 11.499 | 0 | 21.356 | 0 | 31.212 | 0 | 41.069 | 0 | 50.925 | 1 | 0.782 | 1 | 10.638 | 10 | .027 |
| 11 | 0 | 1.807 | 0 | 11.663 | 0 | 21.520 | 0 | 31.376 | 0 | 41.233 | 0 | 51.089 | 1 | 0.946 | 1 | 10.802 | 11 | .030 |
| 12 | 0 | 1.971 | 0 | 11.828 | 0 | 21.684 | 0 | 31.541 | 0 | 41.397 | 0 | 51.254 | 1 | 1.110 | 1 | 10.967 | 12 | .033 |
| 13 | 0 | 2.136 | 0 | 11.992 | 0 | 21.849 | 0 | 31.705 | 0 | 41.561 | 0 | 51.418 | 1 | 1.274 | 1 | 11.131 | 13 | .036 |
| 14 | 0 | 2.300 | 0 | 12.156 | 0 | 22.013 | 0 | 31.869 | 0 | 41.726 | 0 | 51.582 | 1 | 1.439 | 1 | 11.295 | 14 | .038 |
| 15 | 0 | 2.464 | 0 | 12.321 | 0 | 22.177 | 0 | 32.034 | 0 | 41.890 | 0 | 51.746 | 1 | 1.603 | 1 | 11.459 | 15 | .041 |
| 16 | 0 | 2.628 | 0 | 12.485 | 0 | 22.341 | 0 | 32.198 | 0 | 42.054 | 0 | 51.911 | 1 | 1.767 | 1 | 11.624 | 16 | .044 |
| 17 | 0 | 2.793 | 0 | 12.649 | 0 | 22.506 | 0 | 32.362 | 0 | 42.219 | 0 | 52.075 | 1 | 1.932 | 1 | 11.788 | 17 | .047 |
| 18 | 0 | 2.957 | 0 | 12.813 | 0 | 22.670 | 0 | 32.526 | 0 | 42.383 | 0 | 52.239 | 1 | 2.096 | 1 | 11.952 | 18 | .049 |
| 19 | 0 | 3.121 | 0 | 12.978 | 0 | 22.834 | 0 | 32.691 | 0 | 42.547 | 0 | 52.404 | 1 | 2.260 | 1 | 12.117 | 19 | .052 |
| 20 | 0 | 3.285 | 0 | 13.142 | 0 | 22.998 | 0 | 32.855 | 0 | 42.711 | 0 | 52.568 | 1 | 2.424 | 1 | 12.281 | 20 | .055 |
| 21 | 0 | 3.450 | 0 | 13.306 | 0 | 23.163 | 0 | 33.019 | 0 | 42.876 | 0 | 52.732 | 1 | 2.589 | 1 | 12.445 | 21 | .057 |
| 22 | 0 | 3.614 | 0 | 13.471 | 0 | 23.327 | 0 | 33.183 | 0 | 43.040 | 0 | 52.896 | 1 | 2.753 | 1 | 12.609 | 22 | .060 |
| 23 | 0 | 3.778 | 0 | 13.635 | 0 | 23.491 | 0 | 33.348 | 0 | 43.204 | 0 | 53.061 | 1 | 2.917 | 1 | 12.774 | 23 | .063 |
| 24 | 0 | 3.943 | 0 | 13.799 | 0 | 23.656 | 0 | 33.512 | 0 | 43.368 | 0 | 53.225 | 1 | 3.081 | 1 | 12.938 | 24 | .066 |
| 25 | 0 | 4.107 | 0 | 13.963 | 0 | 23.820 | 0 | 33.676 | 0 | 43.533 | 0 | 53.389 | 1 | 3.246 | 1 | 13.102 | 25 | .068 |
| 26 | 0 | 4.271 | 0 | 14.128 | 0 | 23.984 | 0 | 33.841 | 0 | 43.697 | 0 | 53.554 | 1 | 3.410 | 1 | 13.266 | 26 | .071 |
| 27 | 0 | 4.435 | 0 | 14.292 | 0 | 24.148 | 0 | 34.005 | 0 | 43.861 | 0 | 53.718 | 1 | 3.574 | 1 | 13.431 | 27 | .074 |
| 28 | 0 | 4.600 | 0 | 14.456 | 0 | 24.313 | 0 | 34.169 | 0 | 44.026 | 0 | 53.882 | 1 | 3.739 | 1 | 13.595 | 28 | .077 |
| 29 | 0 | 4.764 | 0 | 14.620 | 0 | 24.477 | 0 | 34.333 | 0 | 44.190 | 0 | 54.046 | 1 | 3.903 | 1 | 13.759 | 29 | .079 |
| 30 | 0 | 4.928 | 0 | 14.785 | 0 | 24.641 | 0 | 34.498 | 0 | 44.354 | 0 | 54.211 | 1 | 4.067 | 1 | 13.924 | 30 | .082 |
| 31 | 0 | 5.093 | 0 | 14.949 | 0 | 24.805 | 0 | 34.662 | 0 | 44.518 | 0 | 54.375 | 1 | 4.231 | 1 | 14.088 | 31 | .085 |
| 32 | 0 | 5.257 | 0 | 15.113 | 0 | 24.970 | 0 | 34.826 | 0 | 44.683 | 0 | 54.539 | 1 | 4.396 | 1 | 14.252 | 32 | .088 |
| 33 | 0 | 5.421 | 0 | 15.278 | 0 | 25.134 | 0 | 34.990 | 0 | 44.847 | 0 | 54.703 | 1 | 4.560 | 1 | 14.416 | 33 | .090 |
| 34 | 0 | 5.585 | 0 | 15.442 | 0 | 25.298 | 0 | 35.155 | 0 | 45.011 | 0 | 54.868 | 1 | 4.724 | 1 | 14.581 | 34 | .093 |
| 35 | 0 | 5.750 | 0 | 15.606 | 0 | 25.463 | 0 | 35.319 | 0 | 45.176 | 0 | 55.032 | 1 | 4.888 | 1 | 14.745 | 35 | .096 |
| 36 | 0 | 5.914 | 0 | 15.770 | 0 | 25.627 | 0 | 35.483 | 0 | 45.340 | 0 | 55.196 | 1 | 5.053 | 1 | 14.909 | 36 | .099 |
| 37 | 0 | 6.078 | 0 | 15.935 | 0 | 25.791 | 0 | 35.648 | 0 | 45.504 | 0 | 55.361 | 1 | 5.217 | 1 | 15.073 | 37 | .101 |
| 38 | 0 | 6.242 | 0 | 16.099 | 0 | 25.955 | 0 | 35.812 | 0 | 45.668 | 0 | 55.525 | 1 | 5.381 | 1 | 15.238 | 38 | .104 |
| 39 | 0 | 6.407 | 0 | 16.263 | 0 | 26.120 | 0 | 35.976 | 0 | 45.833 | 0 | 55.689 | 1 | 5.546 | 1 | 15.402 | 39 | .107 |
| 40 | 0 | 6.571 | 0 | 16.427 | 0 | 26.284 | 0 | 36.140 | 0 | 45.997 | 0 | 55.853 | 1 | 5.710 | 1 | 15.566 | 40 | .110 |
| 41 | 0 | 6.735 | 0 | 16.592 | 0 | 26.448 | 0 | 36.305 | 0 | 46.161 | 0 | 56.018 | 1 | 5.874 | 1 | 15.731 | 41 | .112 |
| 42 | 0 | 6.900 | 0 | 16.756 | 0 | 26.612 | 0 | 36.469 | 0 | 46.325 | 0 | 56.182 | 1 | 6.038 | 1 | 15.895 | 42 | .115 |
| 43 | 0 | 7.064 | 0 | 16.920 | 0 | 26.777 | 0 | 36.633 | 0 | 46.490 | 0 | 56.346 | 1 | 6.203 | 1 | 16.059 | 43 | .118 |
| 44 | 0 | 7.228 | 0 | 17.085 | 0 | 26.941 | 0 | 36.798 | 0 | 46.654 | 0 | 56.510 | 1 | 6.367 | 1 | 16.223 | 44 | .120 |
| 45 | 0 | 7.392 | 0 | 17.249 | 0 | 27.105 | 0 | 36.962 | 0 | 46.818 | 0 | 56.675 | 1 | 6.531 | 1 | 16.388 | 45 | .123 |
| 46 | 0 | 7.557 | 0 | 17.413 | 0 | 27.270 | 0 | 37.126 | 0 | 46.983 | 0 | 56.839 | 1 | 6.695 | 1 | 16.552 | 46 | .126 |
| 47 | 0 | 7.721 | 0 | 17.577 | 0 | 27.434 | 0 | 37.290 | 0 | 47.147 | 0 | 57.003 | 1 | 6.860 | 1 | 16.716 | 47 | .129 |
| 48 | 0 | 7.885 | 0 | 17.742 | 0 | 27.598 | 0 | 37.455 | 0 | 47.311 | 0 | 57.168 | 1 | 7.024 | 1 | 16.881 | 48 | .131 |
| 49 | 0 | 8.049 | 0 | 17.906 | 0 | 27.762 | 0 | 37.619 | 0 | 47.475 | 0 | 57.332 | 1 | 7.188 | 1 | 17.045 | 49 | .134 |
| 50 | 0 | 8.214 | 0 | 18.070 | 0 | 27.927 | 0 | 37.783 | 0 | 47.640 | 0 | 57.496 | 1 | 7.353 | 1 | 17.209 | 50 | .137 |
| 51 | 0 | 8.378 | 0 | 18.234 | 0 | 28.091 | 0 | 37.947 | 0 | 47.804 | 0 | 57.660 | 1 | 7.517 | 1 | 17.373 | 51 | .140 |
| 52 | 0 | 8.542 | 0 | 18.399 | 0 | 28.255 | 0 | 38.112 | 0 | 47.968 | 0 | 57.825 | 1 | 7.681 | 1 | 17.538 | 52 | .142 |
| 53 | 0 | 8.707 | 0 | 18.563 | 0 | 28.420 | 0 | 38.276 | 0 | 48.132 | 0 | 57.989 | 1 | 7.845 | 1 | 17.702 | 53 | .145 |
| 54 | 0 | 8.871 | 0 | 18.727 | 0 | 28.584 | 0 | 38.440 | 0 | 48.297 | 0 | 58.153 | 1 | 8.010 | 1 | 17.866 | 54 | .148 |
| 55 | 0 | 9.035 | 0 | 18.892 | 0 | 28.748 | 0 | 38.605 | 0 | 48.461 | 0 | 58.317 | 1 | 8.174 | 1 | 18.030 | 55 | .151 |
| 56 | 0 | 9.199 | 0 | 19.056 | 0 | 28.912 | 0 | 38.769 | 0 | 48.625 | 0 | 58.482 | 1 | 8.338 | 1 | 18.195 | 56 | .153 |
| 57 | 0 | 9.364 | 0 | 19.220 | 0 | 29.077 | 0 | 38.933 | 0 | 48.790 | 0 | 58.646 | 1 | 8.502 | 1 | 18.359 | 57 | .156 |
| 58 | 0 | 9.528 | 0 | 19.384 | 0 | 29.241 | 0 | 39.097 | 0 | 48.954 | 0 | 58.810 | 1 | 8.667 | 1 | 18.523 | 58 | .159 |
| 59 | 0 | 9.692 | 0 | 19.549 | 0 | 29.405 | 0 | 39.262 | 0 | 49.118 | 0 | 58.975 | 1 | 8.831 | 1 | 18.688 | 59 | 0.162 |

# TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

| Mean Solar. | $8^{h.}$ | $9^{h.}$ | $10^{h.}$ | $11^{h.}$ | $12^{h.}$ | $13^{h.}$ | $14^{h.}$ | $15^{h.}$ | For Seconds. | |
|---|---|---|---|---|---|---|---|---|---|---|
| m | m s | m s | m s | m s | m s | m s | m s | m s | s | s |
| 0 | 1 18.852 | 1 28.708 | 1 38.565 | 1 48.421 | 1 58.278 | 2 8.134 | 2 17.991 | 2 27.847 | | |
| 1 | 1 19.016 | 1 28.873 | 1 38.729 | 1 48.585 | 1 58.442 | 2 8.298 | 2 18.155 | 2 28.011 | 1 | 0.003 |
| 2 | 1 19.180 | 1 29.037 | 1 38.893 | 1 48.750 | 1 58.606 | 2 8.463 | 2 18.319 | 2 28.176 | 2 | .005 |
| 3 | 1 19.345 | 1 29.201 | 1 39.058 | 1 48.914 | 1 58.771 | 2 8.627 | 2 18.483 | 2 28.340 | 3 | .008 |
| 4 | 1 19.509 | 1 29.365 | 1 39.222 | 1 49.078 | 1 58.935 | 2 8.791 | 2 18.648 | 2 28.504 | 4 | .011 |
| 5 | 1 19.673 | 1 29.530 | 1 39.386 | 1 49.243 | 1 59.099 | 2 8.956 | 2 18.812 | 2 28.668 | 5 | .014 |
| 6 | 1 19.837 | 1 29.694 | 1 39.550 | 1 49.407 | 1 59.263 | 2 9.120 | 2 18.976 | 2 28.833 | 6 | .016 |
| 7 | 1 20.002 | 1 29.858 | 1 39.715 | 1 49.571 | 1 59.428 | 2 9.284 | 2 19.141 | 2 28.997 | 7 | .019 |
| 8 | 1 20.166 | 1 30.022 | 1 39.879 | 1 49.735 | 1 59.592 | 2 9.448 | 2 19.305 | 2 29.161 | 8 | .022 |
| 9 | 1 20.330 | 1 30.187 | 1 40.043 | 1 49.900 | 1 59.756 | 2 9.613 | 2 19.469 | 2 29.326 | 9 | .025 |
| 10 | 1 20.495 | 1 30.351 | 1 40.207 | 1 50.064 | 1 59.920 | 2 9.777 | 2 19.633 | 2 29.490 | 10 | .027 |
| 11 | 1 20.659 | 1 30.515 | 1 40.372 | 1 50.228 | 2 0.085 | 2 9.941 | 2 19.798 | 2 29.654 | 11 | .030 |
| 12 | 1 20.823 | 1 30.680 | 1 40.536 | 1 50.393 | 2 0.249 | 2 10.105 | 2 19.962 | 2 29.818 | 12 | .033 |
| 13 | 1 20.987 | 1 30.844 | 1 40.700 | 1 50.557 | 2 0.413 | 2 10.270 | 2 20.126 | 2 29.983 | 13 | .036 |
| 14 | 1 21.152 | 1 31.008 | 1 40.865 | 1 50.721 | 2 0.578 | 2 10.434 | 2 20.290 | 2 30.147 | 14 | .038 |
| 15 | 1 21.316 | 1 31.172 | 1 41.029 | 1 50.885 | 2 0.742 | 2 10.598 | 2 20.455 | 2 30.311 | 15 | .041 |
| 16 | 1 21.480 | 1 31.337 | 1 41.193 | 1 51.050 | 2 0.906 | 2 10.763 | 2 20.619 | 2 30.476 | 16 | .044 |
| 17 | 1 21.644 | 1 31.501 | 1 41.357 | 1 51.214 | 2 1.070 | 2 10.927 | 2 20.783 | 2 30.640 | 17 | .047 |
| 18 | 1 21.809 | 1 31.665 | 1 41.522 | 1 51.378 | 2 1.235 | 2 11.091 | 2 20.948 | 2 30.804 | 18 | .049 |
| 19 | 1 21.973 | 1 31.829 | 1 41.686 | 1 51.542 | 2 1.399 | 2 11.255 | 2 21.112 | 2 30.968 | 19 | .052 |
| 20 | 1 22.137 | 1 31.994 | 1 41.850 | 1 51.707 | 2 1.563 | 2 11.420 | 2 21.276 | 2 31.133 | 20 | .055 |
| 21 | 1 22.302 | 1 32.158 | 1 42.015 | 1 51.871 | 2 1.727 | 2 11.584 | 2 21.440 | 2 31.297 | 21 | .057 |
| 22 | 1 22.466 | 1 32.322 | 1 42.179 | 1 52.035 | 2 1.892 | 2 11.748 | 2 21.605 | 2 31.461 | 22 | .060 |
| 23 | 1 22.630 | 1 32.487 | 1 42.343 | 1 52.200 | 2 2.056 | 2 11.912 | 2 21.769 | 2 31.625 | 23 | .063 |
| 24 | 1 22.794 | 1 32.651 | 1 42.507 | 1 52.364 | 2 2.220 | 2 12.077 | 2 21.933 | 2 31.790 | 24 | .066 |
| 25 | 1 22.959 | 1 32.815 | 1 42.672 | 1 52.528 | 2 2.385 | 2 12.241 | 2 22.098 | 2 31.954 | 25 | .068 |
| 26 | 1 23.123 | 1 32.979 | 1 42.836 | 1 52.692 | 2 2.549 | 2 12.405 | 2 22.262 | 2 32.118 | 26 | .071 |
| 27 | 1 23.287 | 1 33.144 | 1 43.000 | 1 52.857 | 2 2.713 | 2 12.570 | 2 22.426 | 2 32.283 | 27 | .074 |
| 28 | 1 23.451 | 1 33.308 | 1 43.164 | 1 53.021 | 2 2.877 | 2 12.734 | 2 22.590 | 2 32.447 | 28 | .077 |
| 29 | 1 23.616 | 1 33.472 | 1 43.329 | 1 53.185 | 2 3.042 | 2 12.898 | 2 22.755 | 2 32.611 | 29 | .079 |
| 30 | 1 23.780 | 1 33.637 | 1 43.493 | 1 53.349 | 2 3.206 | 2 13.062 | 2 22.919 | 2 32.775 | 30 | .082 |
| 31 | 1 23.944 | 1 33.801 | 1 43.657 | 1 53.514 | 2 3.370 | 2 13.227 | 2 23.083 | 2 32.940 | 31 | .085 |
| 32 | 1 24.109 | 1 33.965 | 1 43.822 | 1 53.678 | 2 3.534 | 2 13.391 | 2 23.247 | 2 33.104 | 32 | .088 |
| 33 | 1 24.273 | 1 34.129 | 1 43.986 | 1 53.842 | 2 3.699 | 2 13.555 | 2 23.412 | 2 33.268 | 33 | .090 |
| 34 | 1 24.437 | 1 34.294 | 1 44.150 | 1 54.007 | 2 3.863 | 2 13.720 | 2 23.576 | 2 33.432 | 34 | .093 |
| 35 | 1 24.601 | 1 34.458 | 1 44.314 | 1 54.171 | 2 4.027 | 2 13.884 | 2 23.740 | 2 33.597 | 35 | .096 |
| 36 | 1 24.766 | 1 34.622 | 1 44.479 | 1 54.335 | 2 4.192 | 2 14.048 | 2 23.905 | 2 33.761 | 36 | .099 |
| 37 | 1 24.930 | 1 34.786 | 1 44.643 | 1 54.499 | 2 4.356 | 2 14.212 | 2 24.069 | 2 33.925 | 37 | .101 |
| 38 | 1 25.094 | 1 34.951 | 1 44.807 | 1 54.664 | 2 4.520 | 2 14.377 | 2 24.233 | 2 34.090 | 38 | .104 |
| 39 | 1 25.259 | 1 35.115 | 1 44.971 | 1 54.828 | 2 4.684 | 2 14.541 | 2 24.397 | 2 34.254 | 39 | .107 |
| 40 | 1 25.423 | 1 35.279 | 1 45.136 | 1 54.992 | 2 4.849 | 2 14.705 | 2 24.562 | 2 34.418 | 40 | .110 |
| 41 | 1 25.587 | 1 35.444 | 1 45.300 | 1 55.156 | 2 5.013 | 2 14.869 | 2 24.726 | 2 34.582 | 41 | .112 |
| 42 | 1 25.751 | 1 35.608 | 1 45.464 | 1 55.321 | 2 5.177 | 2 15.034 | 2 24.890 | 2 34.747 | 42 | .115 |
| 43 | 1 25.916 | 1 35.772 | 1 45.629 | 1 55.485 | 2 5.342 | 2 15.198 | 2 25.054 | 2 34.911 | 43 | .118 |
| 44 | 1 26.080 | 1 35.936 | 1 45.793 | 1 55.649 | 2 5.506 | 2 15.362 | 2 25.219 | 2 35.075 | 44 | .120 |
| 45 | 1 26.244 | 1 36.101 | 1 45.957 | 1 55.814 | 2 5.670 | 2 15.527 | 2 25.383 | 2 35.239 | 45 | .123 |
| 46 | 1 26.408 | 1 36.265 | 1 46.121 | 1 55.978 | 2 5.834 | 2 15.691 | 2 25.547 | 2 35.404 | 46 | .126 |
| 47 | 1 26.573 | 1 36.429 | 1 46.286 | 1 56.142 | 2 5.999 | 2 15.855 | 2 25.712 | 2 35.568 | 47 | .129 |
| 48 | 1 26.737 | 1 36.593 | 1 46.450 | 1 56.306 | 2 6.163 | 2 16.019 | 2 25.876 | 2 35.732 | 48 | .131 |
| 49 | 1 26.901 | 1 36.758 | 1 46.614 | 1 56.471 | 2 6.327 | 2 16.184 | 2 26.040 | 2 35.897 | 49 | .134 |
| 50 | 1 27.066 | 1 36.922 | 1 46.778 | 1 56.635 | 2 6.491 | 2 16.348 | 2 26.204 | 2 36.061 | 50 | .137 |
| 51 | 1 27.230 | 1 37.086 | 1 46.943 | 1 56.799 | 2 6.656 | 2 16.512 | 2 26.369 | 2 36.225 | 51 | .140 |
| 52 | 1 27.394 | 1 37.251 | 1 47.107 | 1 56.964 | 2 6.820 | 2 16.676 | 2 26.533 | 2 36.389 | 52 | .142 |
| 53 | 1 27.558 | 1 37.415 | 1 47.271 | 1 57.128 | 2 6.984 | 2 16.841 | 2 26.697 | 2 36.554 | 53 | .145 |
| 54 | 1 27.723 | 1 37.579 | 1 47.436 | 1 57.292 | 2 7.149 | 2 17.005 | 2 26.861 | 2 36.718 | 54 | .148 |
| 55 | 1 27.887 | 1 37.743 | 1 47.600 | 1 57.456 | 2 7.313 | 2 17.169 | 2 27.026 | 2 36.882 | 55 | .151 |
| 56 | 1 28.051 | 1 37.908 | 1 47.764 | 1 57.621 | 2 7.477 | 2 17.334 | 2 27.190 | 2 37.047 | 56 | .153 |
| 57 | 1 28.215 | 1 38.072 | 1 47.928 | 1 57.785 | 2 7.641 | 2 17.498 | 2 27.354 | 2 37.211 | 57 | .156 |
| 58 | 1 28.380 | 1 38.236 | 1 48.093 | 1 57.949 | 2 7.806 | 2 17.662 | 2 27.519 | 2 37.375 | 58 | .159 |
| 59 | 1 28.544 | 1 38.400 | 1 48.257 | 1 58.113 | 2 7.970 | 2 17.826 | 2 27.683 | 2 37.539 | 59 | 0.162 |

# TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

## TO BE ADDED TO A MEAN TIME INTERVAL.

| Mean Solar. | $16^{\text{h.}}$ | $17^{\text{h.}}$ | $18^{\text{h.}}$ | $19^{\text{h.}}$ | $20^{\text{h.}}$ | $21^{\text{h.}}$ | $22^{\text{h.}}$ | $23^{\text{h.}}$ | For Seconds. | |
|---|---|---|---|---|---|---|---|---|---|---|
| m | m s | m s | m s | m s | m s | m s | m s | m s | s | s |
| 0 | 2 37.704 | 2 47.560 | 2 57.417 | 3 7.273 | 3 17.129 | 3 26.986 | 3 36.842 | 3 46.699 | | |
| 1 | 2 37.868 | 2 47.724 | 2 57.581 | 3 7.437 | 3 17.294 | 3 27.150 | 3 37.007 | 3 46.863 | 1 | 0.003 |
| 2 | 2 38.032 | 2 47.889 | 2 57.745 | 3 7.602 | 3 17.458 | 3 27.315 | 3 37.171 | 3 47.027 | 2 | .005 |
| 3 | 2 38.196 | 2 48.053 | 2 57.909 | 3 7.766 | 3 17.622 | 3 27.479 | 3 37.335 | 3 47.192 | 3 | .008 |
| 4 | 2 38.361 | 2 48.217 | 2 58.074 | 3 7.930 | 3 17.787 | 3 27.643 | 3 37.500 | 3 47.356 | 4 | .011 |
| 5 | 2 38.525 | 2 48.381 | 2 58.238 | 3 8.094 | 3 17.951 | 3 27.807 | 3 37.664 | 3 47.520 | 5 | .014 |
| 6 | 2 38.689 | 2 48.546 | 2 58.402 | 3 8.259 | 3 18.115 | 3 27.972 | 3 37.828 | 3 47.685 | 6 | .016 |
| 7 | 2 38.854 | 2 48.710 | 2 58.566 | 3 8.423 | 3 18.279 | 3 28.136 | 3 37.992 | 3 47.849 | 7 | .019 |
| 8 | 2 39.018 | 2 48.874 | 2 58.731 | 3 8.587 | 3 18.444 | 3 28.300 | 3 38.157 | 3 48.013 | 8 | .022 |
| 9 | 2 39.182 | 2 49.039 | 2 58.895 | 3 8.751 | 3 18.608 | 3 38.464 | 3 38.321 | 3 48.177 | 9 | .025 |
| 10 | 2 39.346 | 2 49.203 | 2 59.059 | 3 8.916 | 3 18.772 | 3 28.629 | 3 38.485 | 3 48.342 | 10 | .027 |
| 11 | 2 39.511 | 2 49.367 | 2 59.224 | 3 9.080 | 3 18.937 | 3 28.793 | 3 38.649 | 3 48.506 | 11 | .030 |
| 12 | 2 39.675 | 2 49.531 | 2 59.388 | 3 9.244 | 3 19.101 | 3 28.957 | 3 38.814 | 3 48.670 | 12 | .033 |
| 13 | 2 39.839 | 2 49.696 | 2 59.552 | 3 9.409 | 3 19.265 | 3 29.122 | 3 38.978 | 3 48.834 | 13 | .036 |
| 14 | 2 40.003 | 2 49.860 | 2 59.716 | 3 9.573 | 3 19.429 | 3 29.286 | 3 39.142 | 3 48.999 | 14 | .038 |
| 15 | 2 40.168 | 2 50.024 | 2 59.881 | 3 9.737 | 3 19.594 | 3 29.450 | 3 39.307 | 3 49.163 | 15 | .041 |
| 16 | 2 40.332 | 2 50.188 | 3 0.045 | 3 9.901 | 3 19.758 | 3 29.614 | 3 39.471 | 3 49.327 | 16 | .044 |
| 17 | 2 40.496 | 2 50.353 | 3 0.209 | 3 10.066 | 3 19.922 | 3 29.779 | 3 39.635 | 3 49.492 | 17 | .047 |
| 18 | 2 40.661 | 2 50.517 | 3 0.373 | 3 10.230 | 3 20.086 | 3 29.943 | 3 39.799 | 3 49.656 | 18 | .049 |
| 19 | 2 40.825 | 2 50.681 | 3 0.538 | 3 10.394 | 3 20.251 | 3 30.107 | 3 39.964 | 3 49.820 | 19 | .052 |
| 20 | 2 40.989 | 2 50.846 | 3 0.702 | 3 10.559 | 3 20.415 | 3 30.271 | 3 40.128 | 3 49.984 | 20 | .055 |
| 21 | 2 41.153 | 2 51.010 | 3 0.866 | 3 10.723 | 3 20.579 | 3 30.436 | 3 40.292 | 3 50.149 | 21 | .057 |
| 22 | 2 41.318 | 2 51.174 | 3 1.031 | 3 10.887 | 3 20.744 | 3 30.600 | 3 40.456 | 3 50.313 | 22 | .060 |
| 23 | 2 41.482 | 2 51.338 | 3 1.195 | 3 11.051 | 3 20.908 | 3 30.764 | 3 40.621 | 3 50.477 | 23 | .063 |
| 24 | 2 41.646 | 2 51.503 | 3 1.359 | 3 11.216 | 3 21.072 | 3 30.929 | 3 40.785 | 3 50.642 | 24 | .066 |
| 25 | 2 41.810 | 2 51.667 | 3 1.523 | 3 11.380 | 3 21.236 | 3 31.093 | 3 40.949 | 3 50.806 | 25 | .068 |
| 26 | 2 41.975 | 2 51.831 | 3 1.688 | 3 11.544 | 3 21.401 | 3 31.257 | 3 41.114 | 3 50.970 | 26 | .071 |
| 27 | 2 42.139 | 2 51.995 | 3 1.852 | 3 11.708 | 3 21.565 | 3 31.421 | 3 41.278 | 3 51.134 | 27 | .074 |
| 28 | 2 42.303 | 2 52.160 | 3 2.016 | 3 11.873 | 3 21.729 | 3 31.586 | 3 41.442 | 3 51.299 | 28 | .077 |
| 29 | 2 42.468 | 2 52.324 | 3 2.181 | 3 12.037 | 3 21.893 | 3 31.750 | 3 41.606 | 3 51.463 | 29 | .079 |
| 30 | 2 42.632 | 2 52.488 | 3 2.345 | 3 12.201 | 3 22.058 | 3 31.914 | 3 41.771 | 3 51.627 | 30 | .082 |
| 31 | 2 42.796 | 2 52.653 | 3 2.509 | 3 12.366 | 3 22.222 | 3 32.078 | 3 41.935 | 3 51.791 | 31 | .085 |
| 32 | 2 42.960 | 2 52.817 | 3 2.673 | 3 12.530 | 3 22.386 | 3 32 243 | 3 42.099 | 3 51.956 | 32 | .088 |
| 33 | 2 43.125 | 2 52.981 | 3 2.838 | 3 12.694 | 3 22.551 | 3 32.407 | 3 42.264 | 3 52.120 | 33 | .090 |
| 34 | 2 43.289 | 2 53.145 | 3 3.002 | 3 12.858 | 3 22.715 | 3 32.571 | 3 42.428 | 3 52.284 | 34 | .093 |
| 35 | 2 43.453 | 2 53.310 | 3 3.166 | 3 13.023 | 3 22.879 | 3 32.736 | 3 42.592 | 3 52.449 | 35 | .096 |
| 36 | 2 43.617 | 2 53.474 | 3 3.330 | 3 13.187 | 3 23.043 | 3 32.900 | 3 42.756 | 3 52.613 | 36 | .099 |
| 37 | 2 43.782 | 2 53.638 | 3 3.495 | 3 13.351 | 3 23.208 | 3 33.064 | 3 42.921 | 3 52.777 | 37 | .101 |
| 38 | 2 43.946 | 2 53.803 | 3 3.659 | 3 13.515 | 3 23.372 | 3 33.228 | 3 43.085 | 3 52.941 | 38 | .104 |
| 39 | 2 44.110 | 2 53.967 | 3 3.823 | 3 13.680 | 3 23.536 | 3 33.393 | 3 43.249 | 3 53.106 | 39 | .107 |
| 40 | 2 44.275 | 2 54.131 | 3 3.988 | 3 13.844 | 3 23.700 | 3 33.557 | 3 43.413 | 3 53.270 | 40 | .110 |
| 41 | 2 44.439 | 2 54.295 | 3 4.152 | 3 14.008 | 3 23.865 | 3 33.721 | 3 43.578 | 3 53.434 | 41 | .112 |
| 42 | 2 44.603 | 2 54.460 | 3 4.316 | 3 14.173 | 3 24.029 | 3 33.886 | 3 43.742 | 3 53.598 | 42 | .115 |
| 43 | 2 44.767 | 2 54.624 | 3 4.480 | 3 14.337 | 3 24.193 | 3 34.050 | 3 43.906 | 3 53.763 | 43 | .118 |
| 44 | 2 44.932 | 2 54.788 | 3 4 645 | 3 14.501 | 3 24.358 | 3 34.214 | 3 44.071 | 3 53.927 | 44 | .120 |
| 45 | 2 45.096 | 2 54.952 | 3 4.809 | 3 14.665 | 3 24.522 | 3 34.378 | 3 44.235 | 3 54.091 | 45 | .123 |
| 46 | 2 45.260 | 2 55.117 | 3 4.973 | 3 14.830 | 3 24.686 | 3 34.543 | 3 44.399 | 3 54.256 | 46 | .126 |
| 47 | 2 45.425 | 2 55.281 | 3 5.137 | 3 14.994 | 3 24.850 | 3 34.707 | 3 44.563 | 3 54.420 | 47 | .129 |
| 48 | 2 45.589 | 2 55.445 | 3 5.302 | 3 15.158 | 3 25.015 | 3 34.871 | 3 44.728 | 3 54.584 | 48 | .131 |
| 49 | 2 45.753 | 2 55.610 | 3 5.466 | 3 15.322 | 3 25.179 | 3 35.035 | 3 44.892 | 3 54.748 | 49 | .134 |
| 50 | 2 45.917 | 2 55.774 | 3 5.630 | 3 15.487 | 3 25.343 | 3 35.200 | 3 45.056 | 3 54.913 | 50 | .137 |
| 51 | 2 46.082 | 2 55.938 | 3 5.795 | 3 15.651 | 3 25.508 | 3 35.364 | 3 45.220 | 3 55.077 | 51 | .140 |
| 52 | 2 46.246 | 2 56.102 | 3 5.959 | 3 15.815 | 3 25.672 | 3 35.528 | 3 45.385 | 3 55.241 | 52 | .142 |
| 53 | 2 46.410 | 2 56.267 | 3 6.123 | 3 15.980 | 3 25.836 | 3 35.693 | 3 45.549 | 3 55.405 | 53 | .145 |
| 54 | 2 46.574 | 2 56.431 | 3 6.287 | 3 16.144 | 3 26.000 | 3 35.857 | 3 45.713 | 3 55.570 | 54 | .148 |
| 55 | 2 46.739 | 2 56.595 | 3 6.452 | 3 16.308 | 3 26.165 | 3 36.021 | 3 45.878 | 3 55.734 | 55 | .151 |
| 56 | 2 46.903 | 2 56.759 | 3 6.616 | 3 16.472 | 3 26.329 | 3 36.185 | 3 46.042 | 3 55.898 | 56 | .153 |
| 57 | 2 47.067 | 2 56.924 | 3 6.780 | 3 16.637 | 3 26.493 | 3 36.350 | 3 46.206 | 3 56.063 | 57 | .156 |
| 58 | 2 47.232 | 2 57.088 | 3 6.944 | 3 16.801 | 3 26.657 | 3 36 514 | 3 46.370 | 3 56.227 | 58 | .159 |
| 59 | 2 47.396 | 2 57.252 | 3 7.109 | 3 16.965 | 3 26.822 | 3 36.678 | 3 46.535 | 3 56.391 | 59 | 0.162 |

# TABLE IV.

## TABLE GIVING THE CORRECTIONS OF *A* AND *B* WHICH DEPEND ON THE ARGUMENTS 2☾, AND ☾—Γ'.

In units of the *fifth* decimal for *A*, and of the *fourth* for *B*.

| Arg. (2☾) | *A*☾ | *B*☾ | Arg. (2☾) | *A*☾ | *B*☾ | Arg. (2☾ | *A*☾ | *B*☾ | Arg. (☾—Γ') | *A'*☾ |
|---|---|---|---|---|---|---|---|---|---|---|
| d | | | d | | | d | | | d | |
| 0.0 | − 0 | −886 | 4.6 | −347 | +459 | 9.2 | +359 | +410 | 0 | + 0 |
| 0.1 | 19 | 885 | 4.7 | 337 | 493 | 9.3 | 367 | 374 | 1 | 30 |
| 0.2 | 37 | 882 | 4.8 | 326 | 526 | 9.4 | 374 | 335 | 2 | 59 |
| 0.3 | 55 | 877 | 4.9 | 314 | 558 | 9.5 | 381 | 298 | 3 | 85 |
| 0.4 | 74 | 870 | 5.0 | 302 | 589 | 9.6 | 387 | 259 | 4 | 106 |
| 0.5 | 92 | 862 | 5.1 | 289 | 619 | 9.7 | 392 | 221 | 5 | 122 |
| 0.6 | 111 | 852 | 5.2 | 277 | 648 | 9.8 | 396 | 180 | 6 | 132 |
| 0.7 | 128 | 841 | 5.3 | 263 | 675 | 9.9 | 400 | 140 | 7 | 135 |
| 0.8 | 145 | 827 | 5.4 | 248 | 701 | 10.0 | 403 | 101 | 8 | 130 |
| 0.9 | 163 | 811 | 5.5 | 232 | 725 | 10.1 | 404 | 59 | 9 | 119 |
| 1.0 | 180 | 793 | 5.6 | 217 | 748 | 10.2 | 405 | + 19 | 10 | 102 |
| 1.1 | 196 | 775 | 5.7 | 201 | 769 | 10.3 | 405 | − 22 | 11 | 80 |
| 1.2 | 212 | 754 | 5.8 | 185 | 788 | 10.4 | 404 | 62 | 12 | 53 |
| 1.3 | 228 | 732 | 5.9 | 168 | 806 | 10.5 | 402 | 103 | 13 | + 23 |
| 1.4 | 243 | 707 | 6.0 | 151 | 822 | 10.6 | 400 | 143 | 14 | − 7 |
| 1.5 | 258 | 682 | 6.1 | 133 | 837 | 10.7 | 396 | 183 | 15 | 37 |
| 1.6 | 272 | 657 | 6.2 | 116 | 849 | 10.8 | 392 | 224 | 16 | 66 |
| 1.7 | 285 | 628 | 6.3 | 98 | 859 | 10.9 | 387 | 263 | 17 | 90 |
| 1.8 | 298 | 598 | 6.4 | 79 | 868 | 11.0 | 380 | 301 | 18 | 110 |
| 1.9 | 310 | 569 | 6.5 | 61 | 875 | 11.1 | 374 | 338 | 19 | 125 |
| 2.0 | 322 | 537 | 6.6 | 42 | 881 | 11.2 | 367 | 376 | 20 | 134 |
| 2.1 | 333 | 503 | 6.7 | 24 | 884 | 11.3 | 359 | 412 | 21 | 134 |
| 2.2 | 344 | 470 | 6.8 | − 6 | 886 | 11.4 | 350 | 449 | 22 | 129 |
| 2.3 | 353 | 435 | 6.9 | + 13 | 885 | 11.5 | 340 | 483 | 23 | 116 |
| 2.4 | 362 | 399 | 7.0 | 32 | 883 | 11.6 | 329 | 516 | 24 | 97 |
| 2.5 | 370 | 362 | 7.1 | 49 | 879 | 11.7 | 317 | 549 | 25 | 74 |
| 2.6 | 376 | 324 | 7.2 | 68 | 873 | 11.8 | 306 | 581 | 26 | 47 |
| 2.7 | 383 | 285 | 7.3 | 86 | 865 | 11.9 | 293 | 610 | 27 | − 17 |
| 2.8 | 389 | 247 | 7.4 | 105 | 855 | 12.0 | 281 | 640 | 28 | + 13 |
| 2.9 | 394 | 209 | 7.5 | 123 | 844 | 12.1 | 267 | 667 | 29 | + 43 |
| 3.0 | 398 | 169 | 7.6 | 140 | 831 | 12.2 | 252 | 693 | | |
| 3.1 | 401 | 129 | 7.7 | 158 | 815 | 12.3 | 237 | 717 | | |
| 3.2 | 403 | 88 | 7.8 | 175 | 799 | 12.4 | 221 | 741 | | |
| 3.3 | 404 | 46 | 7.9 | 191 | 781 | 12.5 | 206 | 762 | | |
| 3.4 | 405 | − 6 | 8.0 | 207 | 761 | 12.6 | 190 | 782 | | |
| 3.5 | 405 | + 35 | 8.1 | 223 | 738 | 12.7 | 174 | 800 | | |
| 3.6 | 404 | 76 | 8.2 | 239 | 715 | 12.8 | 156 | 817 | | |
| 3.7 | 402 | 116 | 8.3 | 254 | 691 | 12.9 | 138 | 833 | | |
| 3.8 | 399 | 155 | 8.4 | 268 | 665 | 13.0 | 121 | 845 | | |
| 3.9 | 395 | 196 | 8.5 | 282 | 637 | 13.1 | 104 | 856 | | |
| 4.0 | 390 | 235 | 8.6 | 294 | 607 | 13.2 | 85 | 866 | | |
| 4.1 | 385 | 274 | 8.7 | 306 | 578 | 13.3 | 67 | 873 | | |
| 4.2 | 378 | 312 | 8.8 | 319 | 546 | 13.4 | 48 | 879 | | |
| 4.3 | 372 | 350 | 8.9 | 330 | 514 | 13.5 | 30 | 883 | | |
| 4.4 | 364 | 388 | 9.0 | 341 | 480 | 13.6 | + 11 | 885 | | |
| 4.5 | −356 | +424 | 9.1 | +350 | +446 | 13.7 | − 7 | −885 | | |

Multiples of the Period of (2☾)

| | |
|---|---|
| | d |
| 1 | 13.661 |
| 2 | 27.322 |
| 3 | 40.982 |

Multiples of the Period of (☾—Γ')

| | |
|---|---|
| | d |
| 1 | 27.55 |
| 2 | 55.11 |

**Arguments.** *Washington Mean Noon.*

| 1876. | Arg. (2☾) | Arg. (☾—Γ') | 1876. | Arg. (2☾) | Arg. (☾—Γ') | Remarks. |
|---|---|---|---|---|---|---|
| | d | d | | d | d | |
| Jan. 0 | 11.306 | 19.22 | Aug. 0 | 5.733 | 11.78 | To the argument for the beginning of any month, add the day of the month and Washington mean time, and subtract the largest contained multiple of the period. |
| Feb. 0 | 1.324 | 22.67 | Sept. 0 | 9.411 | 15.23 | |
| March 0 | 3.002 | 24.11 | Oct. 0 | 12.090 | 17.67 | |
| April 0 | 6.680 | 0.00 | Nov. 0 | 2.108 | 21.12 | |
| May 0 | 9.359 | 2.45 | Dec. 0 | 4.786 | 23.57 | |
| June 0 | 13.037 | 5.89 | 1877. | | | |
| July 0 | 2.055 | 8.34 | Jan. 0 | 8.464 | 27.01 | |

# TABLE V.

## TABLE GIVING THE CORRECTIONS OF *A* AND *B* DEPENDING ON THE SMALL TERMS OF THE NUTATION.

In units of the *fifth* decimal for *A*, and of the *fourth* for *B*.

### WASHINGTON MEAN NOON.

| 1876. | Δ *A*. | Δ *B*. | 1876. | Δ *A*. | Δ *B*. | 1876. | Δ *A*. | Δ *B*. |
|---|---|---|---|---|---|---|---|---|
| Jan. 1 | +11 | −89 | May 5 | +15 | − 44 | Sept. 2 | − 5 | +38 |
| 6 | 11 | 87 | 10 | 16 | 60 | 7 | 0 | 39 |
| 11 | 11 | 86 | 15 | 16 | 76 | 12 | + 5 | 36 |
| 16 | 10 | 84 | 20 | 15 | 91 | 17 | 9 | 31 |
| 21 | 9 | 82 | 25 | 13 | 107 | 22 | 11 | 23 |
| 26 | 6 | 79 | 30 | 11 | 121 | 27 | 12 | 13 |
| 31 | 4 | 75 | June 4 | 8 | 131 | Oct. 2 | 12 | + 1 |
| Feb. 5 | + 1 | 68 | 9 | + 4 | 139 | 7 | 11 | −11 |
| 10 | − 2 | 61 | 14 | 0 | 144 | 12 | 10 | 24 |
| 15 | 5 | 53 | 19 | − 5 | 146 | 17 | 8 | 37 |
| 20 | 7 | 44 | 24 | 10 | 143 | 22 | 5 | 50 |
| 25 | 9 | 33 | 29 | 14 | 138 | 27 | + 2 | 61 |
| March 1 | 10 | 23 | July 4 | 18 | 127 | Nov. 1 | − 1 | 70 |
| 6 | 11 | 13 | 9 | 22 | 116 | 6 | 5 | 78 |
| 11 | 11 | − 4 | 14 | 25 | 101 | 11 | 9 | 83 |
| 16 | 11 | + 5 | 19 | 28 | 85 | 16 | 14 | 88 |
| 21 | 10 | 11 | 24 | 29 | 68 | 21 | 18 | 87 |
| 26 | 8 | 15 | 29 | 29 | 50 | 26 | 22 | 86 |
| 31 | 5 | 17 | Aug. 3 | 28 | 31 | Dec. 1 | 24 | 85 |
| April 5 | − 1 | 16 | 8 | 26 | −13 | 6 | 25 | 82 |
| 10 | + 3 | 13 | 13 | 23 | + 3 | 11 | 26 | 79 |
| 15 | 6 | + 6 | 18 | 20 | 15 | 16 | 26 | 75 |
| 20 | 9 | − 3 | 23 | 15 | 26 | 21 | 27 | 70 |
| 25 | 12 | 15 | 28 | −10 | +34 | 26 | 27 | 65 |
| 30 | +14 | −28 |  |  |  | 31 | −27 | −59 |

$$\begin{aligned}\triangle A = &+.00025 \sin (2 \odot - \Omega) +.00009 \sin (2\Gamma' - \Omega)\\ &+.00010 \sin 2 (\odot - \Gamma') +.00005 \cos \Gamma'\\ &-.00005 \sin 2 (\odot - \Omega) +.00004 \sin 2\Gamma'\\ &-.00011 \sin (3 \odot - \Gamma)\end{aligned}$$

$$\begin{aligned}\triangle B = &+0''.0067 \cos (2 \odot - \Omega)\\ &-0.0027 \cos (3 \odot - \Gamma)\\ &+0.0024 \cos (2\Gamma' - \Omega)\\ &-0.0023 \sin \Gamma'\\ &+0.0008 \cos 2\Gamma'\end{aligned}$$

These terms are included in Log. A and Log. B, *f*, G, and Log. *g*, pages 249–257.

# TABLE VI.

## TABLES FOR FINDING THE REDUCTIONS OF MEAN TO APPARENT RIGHT ASCENSIONS WHICH DEPEND ON 2☾ AND ☾ – Γ′.

Hor. Arg. = Star's Right Ascension.

| Arg. (2 ☾) | $\Delta a$ | $\Delta'' a$. | | | | | | | | | | | | | Arg. (2 ☾) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $0^h$ | $1^h$ | $2^h$ | $3^h$ | $4^h$ | $5^h$ | $6^h$ | $7^h$ | $8^h$ | $9^h$ | $10^h$ | $11^h$ | $12^h$ | |
| d | s | s | | | | | | | | | | | | | d |
| 0.0 | -.000 | -.0059 | -57 | -51 | -42 | -29 | -15 | -00 | +15 | +29 | +42 | +51 | +57 | +59 | 0.0 |
| 0.5 | 03 | 57 | 59 | 56 | 50 | 39 | 26 | 12 | +03 | 18 | 32 | 44 | 52 | 57 | 0.5 |
| 1.0 | 05 | 53 | 58 | 58 | 54 | 47 | 37 | 24 | -10 | +05 | 20 | 34 | 45 | 53 | 1.0 |
| 1.5 | 08 | 45 | 53 | 57 | 57 | 53 | 45 | 35 | 22 | -07 | +07 | 22 | 35 | 45 | 1.5 |
| 2.0 | 10 | 36 | 46 | 52 | 55 | 55 | 51 | 43 | 32 | 19 | -06 | +09 | 23 | 36 | 2.0 |
| 2.5 | 11 | 24 | 36 | 45 | 52 | 54 | 54 | 49 | 42 | 31 | 18 | -04 | +11 | 24 | 2.5 |
| 3.0 | 12 | - 11 | 25 | 36 | 45 | 51 | 54 | 53 | 49 | 40 | 30 | 17 | -03 | +11 | 3.0 |
| 3.5 | 12 | + 02 | -12 | 25 | 37 | 46 | 51 | 54 | 52 | 48 | 39 | 29 | 16 | -02 | 3.5 |
| 4.0 | 12 | 15 | +02 | -13 | 26 | 37 | 46 | 52 | 54 | 53 | 48 | 39 | 29 | 15 | 4.0 |
| 4.5 | 11 | 28 | 15 | 00 | 14 | 27 | 39 | 48 | 53 | 55 | 53 | 48 | 40 | 28 | 4.5 |
| 5.0 | 09 | 39 | 27 | +14 | -01 | 15 | 29 | 40 | 49 | 55 | 56 | 54 | 48 | 39 | 5.0 |
| 5.5 | 07 | 48 | 39 | 26 | +12 | -02 | 18 | 31 | 42 | 51 | 56 | 57 | 55 | 48 | 5.5 |
| 6.0 | 05 | 54 | 48 | 37 | 24 | +10 | -05 | 21 | 33 | 45 | 53 | 57 | 59 | 54 | 6.0 |
| 6.5 | -.002 | 58 | 54 | 47 | 36 | 22 | +07 | -08 | 23 | 36 | 47 | 55 | 59 | 58 | 6.5 |
| 7.0 | +.001 | 59 | 58 | 53 | 45 | 33 | 19 | +04 | -11 | 25 | 39 | 49 | 56 | 59 | 7.0 |
| 7.5 | 04 | 56 | 59 | 57 | 52 | 42 | 30 | 16 | +01 | 14 | 28 | 41 | 50 | 56 | 7.5 |
| 8.0 | 06 | 51 | 58 | 58 | 55 | 49 | 39 | 28 | 14 | -01 | 16 | 30 | 42 | 51 | 8.0 |
| 8.5 | 09 | 42 | 51 | 55 | 57 | 54 | 47 | 37 | 25 | +11 | -03 | 18 | 31 | 42 | 8.5 |
| 9.0 | 10 | 32 | 43 | 50 | 55 | 55 | 52 | 45 | 36 | 23 | +09 | -05 | 20 | 32 | 9.0 |
| 9.5 | 12 | 20 | 33 | 43 | 50 | 54 | 54 | 51 | 44 | 34 | 22 | +08 | -07 | 20 | 9.5 |
| 10.0 | 12 | + 07 | 21 | 32 | 43 | 50 | 53 | 53 | 50 | 43 | 33 | 21 | +07 | -07 | 10.0 |
| 10.5 | 12 | - 07 | +07 | 21 | 33 | 43 | 50 | 53 | 53 | 50 | 43 | 32 | 21 | +07 | 10.5 |
| 11.0 | 12 | 20 | -07 | +08 | 22 | 34 | 44 | 51 | 54 | 54 | 50 | 43 | 33 | 20 | 11.0 |
| 11.5 | 10 | 32 | 20 | -05 | +09 | 23 | 36 | 45 | 52 | 55 | 55 | 50 | 43 | 32 | 11.5 |
| 12.0 | 09 | 42 | 31 | 18 | -03 | +11 | 25 | 37 | 47 | 54 | 57 | 55 | 51 | 42 | 12.0 |
| 12.5 | 06 | 51 | 43 | 30 | 16 | -01 | 14 | 27 | 39 | 49 | 55 | 58 | 58 | 51 | 12.5 |
| 13.0 | 04 | 56 | 50 | 41 | 28 | 14 | +01 | 16 | 31 | 42 | 52 | 57 | 59 | 56 | 13.0 |
| 13.5 | + 001 | 59 | 56 | 49 | 39 | 26 | -11 | +04 | 19 | 32 | 45 | 53 | 58 | 59 | 13.5 |
| 14.0 | -.002 | -.0058 | -59 | -55 | -47 | -36 | -23 | -08 | +07 | +22 | +36 | +46 | +54 | +58 | 14.0 |
| | | $12^h$ | $13^h$ | $14^h$ | $15^h$ | $16^h$ | $17^h$ | $18^h$ | $19^h$ | $20^h$ | $21^h$ | $22^h$ | $23^h$ | $24^h$ | |

| Arg. (☾ – Γ′) | $\Delta' a$ | $\Delta''' a$ | | | | | | | Arg. (☾ – Γ′) | $\Delta' a$ | $\Delta''' a$ | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $0^h$ $12^h$ | $1^h$ $11^h$ | $2^h$ $10^h$ | $3^h$ $9^h$ | $4^h$ $8^h$ | $5^h$ $7^h$ | $6^h$ $6^h$ | | | $0^h$ $12^h$ | $1^h$ $11^h$ | $2^h$ $10^h$ | $3^h$ $9^h$ | $4^h$ $8^h$ | $5^h$ $7^h$ | $6^h$ $6^h$ |
| d | s | s | | | | | | | d | s | s | | | | | | |
| 0 | +.000 | .0000 | +0 | +0 | +0 | +0 | +0 | +0 | 14 | -.000 | .0000 | -0 | -0 | -1 | -1 | -1 | -1 |
| 1 | 1 | 0 | 1 | 2 | 3 | 4 | 4 | 4 | 15 | 1 | 0 | 1 | 2 | 3 | 3 | 4 | 4 |
| 2 | 2 | 0 | 2 | 4 | 6 | 7 | 8 | 8 | 16 | 2 | 0 | 2 | 4 | 6 | 8 | 9 | 9 |
| 3 | 3 | 0 | 3 | 6 | 8 | 10 | 11 | 11 | 17 | 3 | 0 | 3 | 6 | 9 | 10 | 12 | 12 |
| 4 | 3 | 0 | 4 | 7 | 10 | 12 | 14 | 14 | 18 | 3 | 0 | 4 | 7 | 10 | 13 | 14 | 15 |
| 5 | 4 | 0 | 4 | 8 | 11 | 14 | 16 | 16 | 19 | 4 | 0 | 4 | 8 | 12 | 14 | 16 | 17 |
| 6 | 4 | 0 | 5 | 9 | 13 | 15 | 17 | 18 | 20 | 4 | 0 | 5 | 9 | 13 | 15 | 17 | 18 |
| 7 | 4 | 0 | 5 | 9 | 13 | 16 | 18 | 18 | 21 | 4 | 0 | 5 | 9 | 13 | 15 | 17 | 18 |
| 8 | 4 | 0 | 4 | 9 | 12 | 15 | 17 | 17 | 22 | 4 | 0 | 4 | 9 | 12 | 15 | 17 | 17 |
| 9 | 4 | 0 | 4 | 8 | 11 | 14 | 15 | 16 | 23 | 4 | 0 | 4 | 8 | 11 | 13 | 15 | 15 |
| 10 | 3 | 0 | 3 | 7 | 10 | 12 | 13 | 14 | 24 | 3 | 0 | 3 | 7 | 9 | 11 | 13 | 13 |
| 11 | 2 | 0 | 3 | 5 | 8 | 9 | 10 | 11 | 25 | 2 | 0 | 3 | 5 | 7 | 9 | 10 | 10 |
| 12 | 2 | 0 | 2 | 4 | 5 | 6 | 7 | 7 | 26 | 1 | 0 | 2 | 3 | 4 | 5 | 6 | 6 |
| 13 | 1 | 0 | +1 | +2 | +2 | +3 | +3 | +3 | 27 | 1 | 0 | -1 | -1 | -2 | -2 | -2 | -2 |
| 14 | +.000 | .0000 | 0 | 0 | -1 | -1 | -1 | -1 | 28 | -.000 | .0000 | 0 | +1 | +1 | +2 | +2 | +2 |
| | | $12^h$ $24^h$ | $13^h$ $23^h$ | $14^h$ $22^h$ | $15^h$ $21^h$ | $16^h$ $20^h$ | $17^h$ $19^h$ | $18^h$ $18^h$ | | | $12^h$ $24^h$ | $13^h$ $23^h$ | $14^h$ $22^h$ | $15^h$ $21^h$ | $16^h$ $20^h$ | $17^h$ $19^h$ | $18^h$ $18^h$ |

$\Delta'' a$ and $\Delta''' a$ are to be multiplied by tan $\delta$ and their signs changed when $a > 12^h$.
The Arguments, (2☾) and (☾ – Γ′), are given in Table IV. for the beginning of each month.

# TABLE VII.

## TABLES FOR FINDING THE REDUCTIONS OF MEAN TO APPARENT DECLINATIONS WHICH DEPEND ON 2 ☾ AND ☾−Γ′.

Hor. Arg. = Star's Right Ascension.

| Arg. (2☾) | Δδ | | | | | | | | | | | | | Arg. (2☾) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $0^h$ | $1^h$ | $2^h$ | $3^h$ | $4^h$ | $5^h$ | $6^h$ | $7^h$ | $8^h$ | $9^h$ | $10^h$ | $11^h$ | $12^h$ | |
| d | ″ | ″ | ″ | ″ | ″ | ″ | ″ | ″ | ″ | ″ | ″ | ″ | ″ | d |
| 0.0 | -.00 | +.02 | +.04 | +.06 | +.08 | +.08 | +.09 | +.08 | +.08 | +.06 | +.04 | +.02 | +.00 | 0.0 |
| 0.5 | .02 | .00 | .02 | .05 | .07 | .08 | .09 | .09 | .08 | .07 | .06 | .04 | .02 | 0.5 |
| 1.0 | .04 | -.01 | +.01 | .03 | .05 | .07 | .08 | .09 | .09 | .08 | .07 | .06 | .04 | 1.0 |
| 1.5 | .05 | .03 | -.01 | +.01 | .03 | .05 | .07 | .08 | .09 | .08 | .08 | .07 | .05 | 1.5 |
| 2.0 | .06 | .05 | .03 | -.01 | +.01 | .03 | .05 | .07 | .08 | .08 | .08 | .08 | .06 | 2.0 |
| 2,5 | .07 | .06 | .05 | .03 | -.01 | +.02 | .04 | .05 | .07 | .08 | .08 | .08 | .07 | 2.5 |
| 3.0 | .08 | .07 | .06 | .04 | .03 | .00 | +.02 | .04 | .05 | .07 | .08 | .08 | .08 | 3.0 |
| 3.5 | .08 | .08 | .07 | .05 | .04 | -.02 | -.01 | +.02 | .04 | .05 | .07 | .08 | .08 | 3.5 |
| 4.0 | .08 | .08 | .08 | .07 | .06 | .04 | .02 | .00 | +.02 | .04 | .06 | .07 | .08 | 4.0 |
| 4.5 | .07 | .08 | .08 | .08 | .08 | .06 | .05 | -.02 | .00 | +.02 | .04 | .06 | .07 | 4.5 |
| 5.0 | .06 | .07 | .08 | .08 | .08 | .07 | .06 | .04 | -.02 | .00 | +.02 | .04 | .06 | 5.0 |
| 5.5 | .05 | .06 | .08 | .08 | .09 | .08 | .07 | .06 | .04 | -.02 | .00 | .03 | .05 | 5.5 |
| 6.0 | .03 | .05 | .07 | .08 | .09 | .09 | .08 | .07 | .06 | .04 | -.02 | +.01 | .03 | 6.0 |
| 6.5 | -.01 | .03 | .05 | .07 | .08 | .09 | .09 | .08 | .07 | .05 | .03 | -.01 | +.01 | 6.5 |
| 7.0 | +.01 | -.02 | .04 | .06 | .07 | .08 | .09 | .09 | .08 | .07 | .05 | .03 | - 01 | 7.0 |
| 7.5 | .02 | .00 | -.02 | .04 | .06 | .07 | .08 | .09 | .08 | .08 | .06 | .04 | .02 | 7.5 |
| 8.0 | .04 | +.02 | .00 | -.02 | .04 | .06 | .08 | .08 | .09 | .08 | .07 | .06 | .04 | 8.0 |
| 8.5 | .06 | .04 | +.01 | .00 | -.03 | .05 | .06 | .08 | .08 | .08 | .08 | .07 | .06 | 8.5 |
| 9.0 | .07 | .05 | .03 | +.01 | -.01 | .03 | .05 | .06 | .08 | .08 | .08 | .08 | .07 | 9.0 |
| 9.5 | .08 | .07 | .05 | .03 | +.01 | -.01 | .03 | .05 | .06 | .07 | .08 | .08 | .08 | 9.5 |
| 10.0 | .08 | .08 | .06 | .05 | .03 | +.01 | -.01 | .03 | .05 | .06 | .07 | .08 | .08 | 10.0 |
| 10.5 | .08 | .08 | .07 | .06 | .05 | .03 | +.01 | -.01 | .03 | .05 | .06 | .07 | .08 | 10.5 |
| 11.0 | .08 | .08 | .08 | .07 | .06 | .05 | .03 | +.01 | -.01 | .03 | .05 | .07 | .08 | 11.0 |
| 11.5 | .07 | .08 | .08 | .08 | .07 | .06 | .05 | .03 | +.01 | -.01 | .04 | .05 | .07 | 11.5 |
| 12.0 | .06 | .07 | .08 | .08 | .08 | .08 | .06 | .05 | .03 | +.01 | -.02 | .04 | .06 | 12.0 |
| 12.5 | .04 | .06 | .07 | .08 | .09 | .08 | .08 | .06 | .05 | .02 | .00 | -.02 | .04 | 12.5 |
| 13.0 | +.02 | .05 | .06 | .08 | .09 | .09 | .08 | .08 | .06 | .04 | +.02 | .00 | -.02 | 13.0 |
| 13,5 | .00 | .03 | .05 | .07 | .08 | .09 | .09 | .08 | .07 | .06 | .04 | +.02 | .00 | 13.5 |
| 14.0 | -.01 | +.01 | +.03 | +.05 | +.07 | +.08 | +.09 | +.09 | +.08 | +.07 | +.05 | +.03 | +.01 | 14.0 |
| | $12^h$ | $13^h$ | $14^h$ | $15^h$ | $16^h$ | $17^h$ | $18^h$ | $19^h$ | $20^h$ | $21^h$ | $22^h$ | $23^h$ | $24^h$ | |

| Arg. (☾−Γ′) | Δ′δ | | | | | | |
|---|---|---|---|---|---|---|---|
| | $0^h$ $24^h$ | $1^h$ $23^h$ | $2^h$ $22^h$ | $3^h$ $21^h$ | $4^h$ $20^h$ | $5^h$ $19^h$ | $6^h$ $18^h$ |
| d | ″ | ″ | ″ | ″ | ″ | ″ | ″ |
| 0 | +0.00 | +0.00 | +0.00 | +0.00 | +0.00 | +0.00 | 0.00 |
| 1 | .01 | .01 | .01 | .00 | .00 | .00 | .00 |
| 2 | .01 | .01 | .01 | .01 | .01 | .00 | .00 |
| 3 | .02 | .02 | .01 | .01 | .01 | .00 | .00 |
| 4 | .02 | .02 | .02 | .01 | .01 | .00 | .00 |
| 5 | .02 | .02 | .02 | .02 | .01 | .01 | .00 |
| 6 | .03 | .03 | .02 | .02 | .01 | .01 | .00 |
| 7 | .03 | .03 | .02 | .02 | .01 | .01 | .00 |
| 8 | .03 | .02 | .02 | .02 | .01 | .01 | .00 |
| 9 | .02 | .02 | .02 | .02 | .01 | .01 | .00 |
| 10 | .02 | .02 | .02 | .01 | .01 | .00 | .00 |
| 11 | .02 | .02 | .01 | .01 | .01 | .00 | .00 |
| 12 | .01 | .01 | .01 | .01 | .01 | .00 | .00 |
| 13 | .01 | .00 | .00 | .00 | .00 | .00 | ·00 |
| 14 | +0.00 | +0.00 | +0.00 | +0.00 | +0.09 | +0.00 | 0.00 |
| | $12^h$ $12^h$ | $11^h$ $13^h$ | $10^h$ $14^h$ | $9^h$ $15^h$ | $8^h$ $16^h$ | $7^h$ $17^h$ | $6^h$ $18^h$ |

| Arg. (☾−Γ′) | Δ′δ | | | | | | |
|---|---|---|---|---|---|---|---|
| | $0^h$ $24^h$ | $1^h$ $23^h$ | $2^h$ $22^h$ | $3^h$ $21^h$ | $4^h$ $20^h$ | $5^h$ $19^h$ | $6^h$ $18^h$ |
| d | ″ | ″ | ″ | ″ | ″ | ″ | ″ |
| 14 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | 0.00 |
| 15 | .01 | .01 | .01 | .00 | .00 | .00 | .00 |
| 16 | .01 | .01 | .01 | .01 | .01 | .00 | .00 |
| 17 | .02 | .02 | .02 | .01 | .01 | .00 | .00 |
| 18 | .02 | .02 | .02 | .02 | .01 | .01 | .00 |
| 19 | .02 | .02 | .02 | .02 | .01 | .01 | .00 |
| 20 | .03 | .03 | .02 | .02 | .01 | .01 | .00 |
| 21 | .03 | .03 | .02 | .02 | .01 | .01 | .00 |
| 22 | .03 | .02 | .02 | .02 | .01 | .01 | .00 |
| 23 | .02 | .02 | .02 | .02 | .01 | .01 | .00 |
| 24 | .02 | .02 | .02 | .01 | .01 | .00 | .00 |
| 25 | .01 | .01 | .01 | .01 | .01 | .00 | .00 |
| 26 | .01 | .01 | .01 | .01 | .00 | .00 | .00 |
| 27 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 28 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | ·0.00 |
| | $12^h$ $12^h$ | $11^h$ $13^h$ | $10^h$ $14^h$ | $9^h$ $15^h$ | $8^h$ $16^h$ | $7^h$ $17^h$ | $6^h$ $18^h$ |

Change the signs of Δδ and Δ′δ when *a* is found at the bottom of the Table.
The Arguments, (2☾) and (☾—Γ′), are given in Table IV. for the beginning of each month.

# VENUS, 1874.

## WASHINGTON MEAN NOON.

Prepared from Hill's tables.

| 1874. | Apparent Right Ascension. | Corr'n to Am'n Ephe's. | Apparent Declination. | Corr'n to Am'n Ephe's. | 1874. | Apparent Right Ascension. | Corr'n to Am'n Ephe's. | Apparent Declination. | Corr'n to Am'n Ephe's. |
|---|---|---|---|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| Jan. 1 | 17 53 27.01 | +0.02 | -23 20 6.7 | -1.7 | May 1 | 3 43 4.26 | -0.12 | +19 54 52.1 | +1.3 |
| 3 | 18 4 24.01 | .02 | 23 25 21.1 | 1.7 | 3 | 3 53 11 79 | .12 | 20 31 42.8 | 1.4 |
| 5 | 18 15 21.66 | .01 | 23 27 42.5 | 1.6 | 5 | 4 3 23.60 | .11 | 21 6 20.6 | 1.4 |
| 7 | 18 26 19 48 | .00 | 23 27 9.7 | 1.7 | 7 | 4 13 39.58 | .10 | 21 38 40.2 | 1.5 |
| 9 | 18 37 16.99 | .02 | 23 23 42.7 | 1.7 | 9 | 4 23 59.55 | .10 | 22 8 36.7 | 1.4 |
| 11 | 18 48 13.70 | +0.01 | -23 17 22.0 | -1.7 | 11 | 4 34 23.32 | -0.09 | +22 36 5.3 | +1.4 |
| 13 | 18 59 9.11 | .03 | 23 8 8.2 | 1.6 | 13 | 4 44 50.61 | .09 | 23 1 1.9 | 1.4 |
| 15 | 19 10 2.74 | .01 | 22 56 2.9 | 1.6 | 15 | 4 55 21.12 | .09 | 23 23 22.4 | 1.4 |
| 17 | 19 20 54.14 | .02 | 22 41 8.5 | 1.6 | 17 | 5 5 54.49 | .08 | 23 43 2.9 | 1.3 |
| 19 | 19 31 42.81 | .02 | 22 23 27.2 | 1.5 | 19 | 5 16 30.32 | .07 | 24 0 0.2 | 1.2 |
| 21 | 19 42 28.41 | +0.02 | -22 3 1.8 | -1.5 | 21 | 5 27 8.17 | -0.07 | +24 14 11.3 | +1.3 |
| 23 | 19 53 10.53 | .01 | 21 39 55.8 | 1.5 | 23 | 5 37 47.60 | .07 | 24 25 33.9 | 1.3 |
| 25 | 20 3 48.83 | +0.03 | 21 14 13.3 | 1.4 | 25 | 5 48 28.12 | .07 | 24 34 6.0 | 1.3 |
| 27 | 20 14 23.00 | .00 | 20 45 58.8 | 1.4 | 27 | 5 59 9.26 | .06 | 24 39 46.5 | 1.2 |
| 29 | 20 24 52.83 | .00 | 20 15 16.4 | 1.4 | 29 | 6 9 50.50 | .06 | 24 42 34.4 | 1·2 |
| 31 | 20 35 18.17 | .00 | 19 42 10.8 | 1.3 | 31 | 6 20 31.37 | .06 | 24 42 29.1 | 1.1 |
| Feb. 2 | 20 45 38.83 | -0.01 | -19 6 47.5 | -1.3 | June 2 | 6 31 11.36 | -0.05 | +24 39 31.2 | +1.1 |
| 4 | 20 55 54.71 | .00 | 18 29 11.3 | 1.2 | 4 | 6 41 50.01 | .05 | 24 33 41.1 | 1.1 |
| 6 | 21 6 5.76 | .00 | 17 49 27.9 | 1.2 | 6 | 6 52 26.82 | .04 | 24 24 59.7 | 1.0 |
| 8 | 21 16 11.96 | .00 | 17 7 43.0 | 1.2 | 8 | 7 3 1.35 | .04 | 24 13 29.0 | 1.0 |
| 10 | 21 26 13.29 | .00 | 16 24 2.1 | 1.1 | 10 | 7 13 33.12 | .03 | 23 59 10.8 | 0.9 |
| 12 | 21 36 9.80 | .00 | -15 38 31.1 | -1.0 | 12 | 7 24 1.70 | -0.02 | +23 42 7.7 | +0.8 |
| 14 | 21 46 1.57 | .00 | 14 51 16.1 | 0.9 | 14 | 7 34 26.67 | .02 | 23 22 22.4 | 0.7 |
| 16 | 21 55 48.65 | +0.01 | 14 2 23.4 | 0.9 | 16 | 7 44 47.66 | .01 | 22 59 58.5 | 0.6 |
| 18 | 22 5 31.17 | -0.01 | 13 11 59.0 | 0.8 | 18 | 7 55 4.28 | .03 | 22 34 59.8 | 0.3 |
| 20 | 22 15 9.28 | .02 | 12 20 9.2 | 0.8 | 20 | 8 5 16.21 | .01 | 22 7 30.4 | 0.4 |
| 22 | 22 24 43.18 | -0.02 | -11 27 0.2 | -0.7 | 22 | 8 15 23.16 | -0.01 | +21 37 34.8 | 0.3 |
| 24 | 22 34 13.06 | .03 | 10 32 38.2 | 0.7 | 24 | 8 25 24.91 | .01 | 21 5 18.0 | 0.2 |
| 26 | 22 43 39 16 | .04 | 9 37 9.3 | 0.6 | 26 | 8 35 21.27 | .01 | 20 30 44.6 | +0.1 |
| 28 | 22 53 1.75 | .04 | 8 40 40.0 | 0.6 | 28 | 8 45 12.10 | .01 | 19 54 0.2 | 0.0 |
| | | | | | 30 | 8 54 57.30 | .01 | 19 15 9.8 | -0.1 |
| Mar. 2 | 23 2 21.10 | -0.05 | - 7 43 15.8 | -0.5 | July 2 | 9 4 36.83 | -0.02 | +18 34 18.8 | -0.3 |
| 4 | 23 11 37.52 | .05 | 6 45 2.8 | 0.4 | 4 | 9 14 10.70 | .01 | 17 51 32.7 | 0.4 |
| 6 | 23 20 51.33 | .05 | 5 46 6.9 | 0.3 | 6 | 9 23 38.94 | .01 | 17 6 57.1 | 0.5 |
| 8 | 23 30 2.84 | .06 | 4 46 34.1 | 0.3 | 8 | 9 33 1.57 | .02 | 16 20 37.4 | 0.6 |
| 10 | 23 39 12.37 | .06 | 3 46 30.2 | 0.2 | 10 | 9 42 18.69 | .03 | 15 32 39.3 | 0.7 |
| 12 | 23 48 20.26 | -0.07 | - 2 46 1.1 | -0.2 | 12 | 9 51 30.41 | -0.02 | +14 43 8.5 | -0.8 |
| 14 | 23 57 26.84 | .07 | 1 45 12.4 | -0.1 | 14 | 10 0 36.84 | .01 | 13 52 10.7 | 0.9 |
| 16 | 0 6 32.45 | .08 | - 0 44 10.4 | 0.0 | 16 | 10 9 38.08 | .01 | 12 59 51.8 | 1.0 |
| 18 | 0 15 37.39 | .08 | + 0 16 59.1 | 0.0 | 18 | 10 18 34.29 | .03 | 12 6 17.4 | 1.2 |
| 20 | 0 24 42.00 | .08 | 1 18 10.2 | +0.1 | 20 | 10 27 25.65 | .02 | 11 11 33.5 | 1.3 |
| 22 | 0 33 46.61 | -0.07 | + 2 19 16.7 | +0.1 | 22 | 10 36 12.33 | -0.02 | +10 15 46.1 | -1.4 |
| 24 | 0 42 51.55 | .08 | 3 20 13.0 | 0.2 | 24 | 10 44 54.52 | .02 | 9 19 0.7 | 1.3 |
| 26 | 0 51 57.13 | .09 | 4 20 52.9 | 0.3 | 26 | 10 53 32.43 | .03 | 8 21 22.8 | 1.6 |
| 28 | 1 1 3.69 | .08 | 5 21 10.6 | 0.4 | 28 | 11 2 6.32 | .03 | 7 22 58.0 | 1.7 |
| 30 | 1 10 11.57 | .09 | 6 21 0.4 | 0.5 | 30 | 11 10 36.45 | .04 | 6 23 51.8 | 1.8 |
| Apr. 1 | 1 19 21.12 | -0.09 | + 7 20 16.4 | +0.6 | Aug. 1 | 11 19 3.08 | -0.03 | + 5 24 9.4 | -1.9 |
| 3 | 1 28 32.64 | .09 | 8 18 52.8 | 0.6 | 3 | 11 27 26.48 | .03 | 4 23 56.0 | 2.0 |
| 5 | 1 37 46.45 | .10 | 9 16 44.1 | 0.7 | 5 | 11 35 46.93 | .03 | 3 23 16.6 | 2.0 |
| 7 | 1 47 2.88 | .10 | 10 13 44.1 | 0.7 | 7 | 11 44 4.71 | .03 | 2 22 16.1 | 2.3 |
| 9 | 1 56 22.21 | .10 | 11 9 47.0 | 0.7 | 9 | 11 52 20.10 | .04 | 1 20 59.8 | 2.3 |
| 11 | 2 5 44.70 | -0.09 | +12 4 47.2 | +0.8 | 11 | 12 0 33.33 | -0.04 | + 0 19 32.7 | -2.2 |
| 13 | 2 15 10.60 | .10 | 12 58 38.2 | 0.8 | 13 | 12 8 44.63 | .04 | - 0 41 59.9 | 2.3 |
| 15 | 2 24 40.13 | .10 | 13 51 14.0 | 0.8 | 15 | 12 16 54.25 | .05 | 1 43 33.1 | 2.6 |
| 17 | 2 34 13.48 | .11 | 14 42 28.9 | 0.9 | 17 | 12 25 2.40 | .05 | 2 45 1.4 | 2.5 |
| 19 | 2 43 50.82 | .10 | 15 32 16.3 | 0.9 | 19 | 12 33 9.28 | .05 | 3 46 19.6 | 2.6 |
| 21 | 2 53 32.27 | -0.10 | +16 20 30.4 | +1.0 | 21 | 12 41 15.08 | -0.05 | - 4 47 22.3 | -2.6 |
| 23 | 3 3 17.95 | .09 | 17 7 4.9 | 1.0 | 23 | 12 49 20.00 | .05 | 5 48 4.6 | 2.6 |
| 25 | 3 13 7.95 | .12 | 17 51 54.3 | 1.1 | 25 | 12 57 24.23 | .05 | 6 48 21.5 | 2.7 |
| 27 | 3 23 2.34 | .12 | 18 34 52.4 | 1.2 | 27 | 13 5 27.92 | 05 | 7 48 7.9 | 2.7 |
| 29 | 3 33 1.09 | -0.13 | +19 15 53.5 | +1.3 | 29 | 13 13 31.27 | .04 | 8 47 19.0 | 2.7 |
| | | | | | 31 | 13 21 34.43 | -0.04 | - 9 45 50.0 | -2.9 |

# VENUS, 1874–5.

## WASHINGTON MEAN NOON.

Prepared from HILL's tables.

| 1874. | Apparent Right Ascension. | Corr'n to Am'n Ephe's. | Apparent Declination. | Corr'n to Am'n Ephe's. | 1875. | Apparent Right Ascension. | Corr'n to Am'n Ephe's. | Apparent Declination. | Corr'n to Am'n Ephe's. |
|---|---|---|---|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| Sept. 2 | 13 29 37.60 | -0.04 | -10 43 36.5 | -3.0 | Jan. 0 | 16 33 56.90 | +0.20 | -17 24 52.0 | +6.3 |
| 4 | 13 37 40.88 | .04 | 11 40 33.7 | 2.8 | 2 | 16 35 4.81 | .17 | 17 17 13.0 | 5.8 |
| 6 | 13 45 44.37 | .04 | 12 36 36.7 | 2.8 | 4 | 16 36 48.74 | .17 | 17 12 42.8 | 5.3 |
| 8 | 13 53 48.14 | .03 | 13 31 40.9 | 2.8 | 6 | 16 39 6.72 | .15 | 17 11 4.6 | 5.0 |
| 10 | 14 1 52.21 | .03 | 14 25 41.6 | 2.7 | 8 | 16 41 56.72 | .13 | 17 12 0.2 | 4.7 |
| 12 | 14 9 56.55 | -0.03 | -15 18 34.1 | -2.7 | 10 | 16 45 16.71 | +0.11 | -17 15 11.2 | +4.3 |
| 14 | 14 18 1.10 | .02 | 16 10 13.1 | 2.6 | 12 | 16 49 4.84 | .10 | 17 20 19.7 | 4.0 |
| 16 | 14 26 5.72 | .02 | 17 0 33.9 | 2.6 | 14 | 16 53 19.30 | .09 | 17 27 7.7 | 3.6 |
| 18 | 14 34 10.24 | .04 | 17 49 31.5 | 2.5 | 16 | 16 57 58.41 | .08 | 17 35 17.7 | 3.1 |
| 20 | 14 42 14.43 | -0.01 | 18 37 1.6 | 2.5 | 18 | 17 3 0.59 | .08 | 17 44 32.6 | 2.7 |
| 22 | 14 50 18.01 | 0.00 | -19 22 59.4 | -2.4 | 20 | 17 8 24.38 | +0.07 | -17 54 36.1 | +2.5 |
| 24 | 14 58 20.68 | .00 | 20 7 20.7 | 2.4 | 22 | 17 14 8.43 | .07 | 18 5 12.8 | 2.2 |
| 26 | 15 6 22.09 | +0.01 | 20 50 1.4 | 2.3 | 24 | 17 20 11.42 | .06 | 18 16 7.7 | 1.9 |
| 28 | 15 14 21.85 | .01 | 21 30 57.6 | 2.1 | 26 | 17 26 32.11 | .06 | 18 27 6.6 | 1.6 |
| 30 | 15 22 19.50 | .02 | 22 10 6.2 | 2.0 | 28 | 17 33 9.30 | .07 | 18 37 56.3 | 1.3 |
| Oct. 2 | 15 30 14.55 | +0.03 | -22 47 23.7 | -1.9 | 30 | 17 40 1.84 | +0.05 | -18 48 24.1 | +1.0 |
| 4 | 15 38 6.41 | .04 | 23 22 47.1 | 1.8 | Feb. 1 | 17 47 8.64 | .03 | 18 58 18.4 | 0.7 |
| 6 | 15 45 54.41 | .05 | 23 56 13.6 | 1.5 | 3 | 17 54 28.65 | .03 | 19 7 28.4 | 0.5 |
| 8 | 15 53 37.78 | .07 | 24 27 40.6 | 1.3 | 5 | 18 2 0.87 | .04 | 19 15 44.4 | +0.3 |
| 10 | 16 1 15.63 | .07 | 24 57 5.7 | 1.2 | 7 | 18 9 44.34 | .04 | 19 22 57.4 | 0.0 |
| 12 | 16 8 46.98 | +0.09 | -25 24 26.5 | -1.0 | 9 | 18 17 38.17 | +0.04 | -19 28 59.1 | -0.3 |
| 14 | 16 16 10.68 | .08 | 25 49 41.2 | 0.7 | 11 | 18 25 41.58 | .03 | 19 33 42.0 | 0.5 |
| 16 | 16 23 25.49 | .10 | 26 12 48.0 | 0.5 | 13 | 18 33 53.81 | .03 | 19 36 59.4 | 0.7 |
| 18 | 16 30 30.04 | .10 | 26 33 45.8 | -0.3 | 15 | 18 42 14.13 | .03 | 19 38 45.0 | 0.8 |
| 20 | 16 37 22.87 | .12 | 26 52 33.8 | 0.0 | 17 | 18 50 41.85 | .03 | 19 38 53.2 | 1.1 |
| 22 | 16 44 2.45 | +0.13 | -27 9 11.5 | +0.3 | 19 | 18 59 16.30 | +0.03 | -19 37 18.9 | -1.3 |
| 24 | 16 50 27.12 | .16 | 27 23 38.5 | 0.7 | 21 | 19 7 56.85 | .04 | 19 33 57.7 | 1.4 |
| 26 | 16 56 35.12 | .16 | 27 35 55.2 | 1.1 | 23 | 19 16 42.87 | .03 | 19 28 45.7 | 1.6 |
| 28 | 17 2 24.62 | .17 | 27 46 2.1 | 1.5 | 25 | 19 25 33.74 | .04 | 19 21 39.4 | 1.8 |
| 30 | 17 7 53.74 | .16 | 27 53 59.6 | 1.8 | 27 | 19 34 28.82 | .04 | 19 12 36.2 | 2.1 |
| Nov. 1 | 17 13 0.44 | +0.16 | -27 59 48.1 | +2.2 | Mar. 1 | 19 43 27.50 | +0.05 | -19 1 34.1 | -2.1 |
| 3 | 17 17 42.56 | .19 | 28 3 27.8 | 2.9 | 3 | 19 52 29.18 | .04 | 18 48 31.9 | 2.2 |
| 5 | 17 21 57.89 | .21 | 28 4 58.8 | 3.6 | 5 | 20 1 33.28 | .04 | 18 33 28.8 | 2.3 |
| 7 | 17 25 44.10 | .23 | 28 4 20.7 | 3.9 | 7 | 20 10 39.25 | .04 | 18 16 24.5 | 2.4 |
| 9 | 17 28 58.71 | .25 | 28 1 32.1 | 4.1 | 9 | 20 19 46.61 | .04 | 17 57 19.5 | 2.4 |
| 11 | 17 31 39.24 | +0.25 | -27 56 31.0 | +4.3 | 11 | 20 28 54.89 | +0.03 | -17 36 14.7 | -2.4 |
| 13 | 17 33 43.25 | .26 | 27 49 14.4 | 4.6 | 13 | 20 38 3.69 | .04 | 17 13 11.3 | 2.4 |
| 15 | 17 35 8.40 | .28 | 27 39 38.2 | 4.9 | 15 | 20 47 12.65 | .04 | 16 48 10.9 | 2.4 |
| 17 | 17 35 52.63 | .28 | 27 27 37.7 | 5.5 | 17 | 20 56 21.47 | .04 | 16 21 15.4 | 2.5 |
| 19 | 17 35 54.36 | .28 | 27 13 7.2 | 6.2 | 19 | 21 5 29.87 | .04 | 15 52 26.9 | 2.5 |
| 21 | 17 35 12.59 | +0.24 | -26 56 0.7 | +6.7 | 21 | 21 14 37.62 | +0.04 | -15 21 47.8 | -2.5 |
| 23 | 17 33 47.20 | .27 | 26 36 12.1 | 7.0 | 23 | 21 23 44.51 | .05 | 14 49 20.8 | 2.6 |
| 25 | 17 31 39.05 | .32 | 26 13 36.7 | 7.5 | 25 | 21 32 50.35 | .05 | 14 15 9.0 | 2.5 |
| 27 | 17 28 50.18 | .36 | 25 48 12.5 | 7.7 | 27 | 21 41 54.97 | .05 | 13 39 15.7 | 2.5 |
| 29 | 17 25 23.90 | .37 | 25 20 0.7 | 8.3 | 29 | 21 50 58.23 | .04 | 13 1 44.8 | 2.6 |
| Dec. 1 | 17 21 24.89 | +0.35 | -24 49 8.6 | +8.5 | 31 | 22 0 0.03 | +0.05 | -12 22 40.3 | -2.5 |
| 3 | 17 16 59.14 | .37 | 24 15 49.9 | 9.1 | Apr. 2 | 22 9 0.26 | .05 | 11 42 6.2 | 2.5 |
| 5 | 17 12 13.70 | .38 | 23 40 25.9 | 9.1 | 4 | 22 17 58.84 | .05 | 11 0 7.0 | 2.5 |
| 7 | 17 7 16.38 | .37 | 23 3 25.7 | 9.1 | 6 | 22 26 55.76 | .05 | 10 16 47.5 | 2.5 |
| 9 | 17 2 15.53 | .38 | 22 25 25.7 | 9.1 | 8 | 22 35 51.00 | .04 | 9 32 12.4 | 2.5 |
| 11 | 16 57 19.57 | +0.38 | -21 47 8.0 | +9.0 | 10 | 22 44 44.60 | +0.04 | - 8 46 26.4 | -2.5 |
| 13 | 16 52 36.54 | .37 | 21 9 17.6 | 8.9 | 12 | 22 53 36.64 | .04 | 7 59 34.1 | 2.4 |
| 15 | 16 48 13.76 | .36 | 20 32 39.9 | 8.9 | 14 | 23 2 27.24 | .04 | 7 11 40.4 | 2.3 |
| 17 | 16 44 17.63 | .34 | 19 57 57.2 | 8.4 | 16 | 23 11 16.51 | .03 | 6 22 50.1 | 2.2 |
| 19 | 16 40 53.38 | .34 | 19 25 47.0 | 8.1 | 18 | 23 20 4.61 | .03 | 5 33 7.9 | 2.2 |
| 21 | 16 38 4.94 | +0.32 | -18 56 39.6 | +8.0 | 20 | 23 28 51.73 | +0.02 | - 4 42 38.6 | -2.1 |
| 23 | 16 35 55.03 | .30 | 18 30 56.9 | 7.7 | 22 | 23 37 38.07 | .02 | 3 51 26.9 | 2.0 |
| 25 | 16 34 25.16 | .26 | 18 8 52.7 | 7.7 | 24 | 23 46 23.81 | .02 | 2 59 37.7 | 1.9 |
| 27 | 16 33 35.85 | .25 | 17 50 32.3 | 7.3 | 26 | 23 55 9.13 | .02 | 2 7 16.2 | 1.9 |
| 29 | 16 33 26.75 | .23 | 17 35 54.5 | 6.9 | 28 | 0 3 54.26 | .01 | 1 14 27.5 | 1.9 |
| 31 | 16 33 56.90 | +0.23 | -17 24 52.0 | +6.3 | 30 | 0 12 39.40 | +0.01 | - 0 21 16.8 | +1.8 |

# VENUS, 1875.

WASHINGTON MEAN NOON.

Prepared from Hill's tables.

| 1875. | Apparent Right Ascension. | Corr'n to Am'n Ephe's. | Apparent Declination. | Corr'n to Am'n Ephe's. | 1875. | Apparent Right Ascension. | Corr'n to Am'n Ephe's. | Apparent Declination. | Corr'n to Am'n Ephe's. |
|---|---|---|---|---|---|---|---|---|---|
| | h m s | s | ° ′ ″ | ″ | | h m s | s | ° ′ ″ | ″ |
| May 2 | 0 21 24.77 | +0.01 | + 0 32 10.7 | -1.7 | Sept. 1 | 10 21 42.17 | 0.00 | +11 39 22.5 | +0.9 |
| 4 | 0 30 10.57 | .00 | 1 25 49.5 | 1.6 | 3 | 10 31 9.30 | -0.02 | 10 46 23.6 | 0.9 |
| 6 | 0 38 57.02 | .00 | 2 19 34.1 | 1.6 | 5 | 10 40 33.23 | .01 | 9 52 13.4 | 0.8 |
| 8 | 0 47 44.36 | .00 | 3 13 19.3 | 1.5 | 7 | 10 49 54.17 | .00 | 8 56 57.8 | 0.8 |
| 10 | 0 56 32.83 | -0.01 | 4 6 59.8 | 1.4 | 9 | 10 59 12.36 | .01 | 8 0 42.5 | 0.6 |
| 12 | 1 5 22.68 | -0.01 | + 5 0 30.1 | -1.4 | 11 | 11 8 28.06 | -0.02 | + 7 3 33.4 | +0.4 |
| 14 | 1 14 14.18 | .01 | 5 53 45.1 | 1.2 | 13 | 11 17 41.55 | .01 | 6 5 36.4 | 0.4 |
| 16 | 1 23 7.59 | .02 | 6 46 39.7 | 1.2 | 15 | 11 26 53.14 | .01 | 5 6 57.2 | 0.3 |
| 18 | 1 32 3.18 | .03 | 7 39 8.7 | 1.0 | 17 | 11 36 3.15 | .01 | 4 7 41.4 | 0.3 |
| 20 | 1 41 1.23 | .04 | 8 31 6.9 | 0.9 | 19 | 11 45 11.88 | .01 | 3 7 54.7 | +0.1 |
| 22 | 1 50 1.99 | -0.04 | + 9 22 28.7 | -0.8 | 21 | 11 54 19.68 | -0.01 | + 2 7 42.9 | -0.1 |
| 24 | 1 59 5.71 | .05 | 10 13 8.8 | 0.7 | 23 | 12 3 26.87 | .02 | 1 7 12.1 | 0.1 |
| 26 | 2 8 12.61 | .05 | 11 3 1.7 | 0.6 | 25 | 12 12 33.76 | .02 | + 0 6 28.0 | 0.1 |
| 28 | 2 17 22.92 | .05 | 11 52 2.0 | 0.5 | 27 | 12 21 40.70 | .02 | - 0 54 23.6 | 0.1 |
| 30 | 2 26 36.82 | .06 | 12 40 3.9 | 0.4 | 29 | 12 30 48.02 | .03 | 1 55 16.6 | 0.2 |
| June 1 | 2 35 54.48 | -0.07 | +13 27 1.7 | -0.3 | Oct. 1 | 12 39 56.04 | -0.04 | - 2 56 4.9 | -0.3 |
| 3 | 2 45 16.06 | .06 | 14 12 49.6 | 0.2 | 3 | 12 49 5.08 | .03 | 3 56 42.3 | 0.3 |
| 5 | 2 54 41.68 | .07 | 14 57 21.9 | -0.1 | 5 | 12 58 15.45 | .03 | 4 57 2.7 | 0.4 |
| 7 | 3 4 11.46 | .07 | 15 40 32.9 | 0.0 | 7 | 13 7 27.48 | .03 | 5 57 0.0 | 0.5 |
| 9 | 3 13 45.50 | .08 | 16 22 16.9 | 0.0 | 9 | 13 16 41.48 | .03 | 6 56 28.1 | 0.6 |
| 11 | 3 23 23.89 | -0.08 | +17 2 28.4 | +0.1 | 11 | 13 25 57.78 | -0.04 | - 7 55 20.9 | -0.6 |
| 13 | 3 33 6.68 | .08 | 17 41 2.1 | 0.2 | 13 | 13 35 16.71 | .05 | 8 53 32.3 | 0.7 |
| 15 | 3 42 53.92 | .08 | 18 17 52.7 | 0.4 | 15 | 13 44 38.60 | .04 | 9 50 56.2 | 0.7 |
| 17 | 3 52 45.63 | .09 | 18 52 54.8 | 0.5 | 17 | 13 54 3.73 | .04 | 10 47 26.5 | 0.7 |
| 19 | 4 2 41.80 | .09 | 19 26 3.3 | 0.6 | 19 | 14 3 32.39 | .04 | 11 42 56.9 | 0.8 |
| 21 | 4 12 42.36 | -0.09 | +19 57 13.0 | +0.7 | 21 | 14 13 4.85 | -0.05 | -12 37 21.2 | -0.9 |
| 23 | 4 22 47.23 | .09 | 20 26 19.0 | 0.8 | 23 | 14 22 41.40 | .05 | 13 30 33.0 | 0.9 |
| 25 | 4 32 56.29 | .09 | 20 53 16.4 | 0.9 | 25 | 14 32 22.23 | .05 | 14 22 25.8 | 1.0 |
| 27 | 4 43 9.38 | .09 | 21 18 0.6 | 1.0 | 27 | 14 42 7.53 | .05 | 15 12 53.1 | 1.0 |
| 29 | 4 53 26.26 | .10 | 21 40 27.1 | 1.0 | 29 | 14 51 57.46 | .06 | 16 1 48.3 | 1.1 |
| July 1 | 5 3 46.68 | -0.09 | +22 0 31.7 | +1.0 | 31 | 15 1 52.18 | -0.05 | -16 49 5.0 | -1.1 |
| 3 | 5 14 10.34 | .09 | 22 18 10.6 | 1.1 | Nov. 2 | 15 11 51.73 | .06 | 17 34 36.6 | 1.1 |
| 5 | 5 24 36.92 | .09 | 22 33 20.3 | 1.1 | 4 | 15 21 56.20 | .07 | 18 18 16.7 | 1.2 |
| 7 | 5 35 6.08 | .09 | 22 45 57.8 | 1.2 | 6 | 15 32 5.60 | .07 | 18 59 59.0 | 1.3 |
| 9 | 5 45 37.44 | .10 | 22 56 0.3 | 1.2 | 8 | 15 42 19.94 | .07 | 19 39 37.3 | 1.3 |
| 11 | 5 56 10.62 | -0.09 | +23 3 25.5 | +1.3 | 10 | 15 52 39.15 | .07 | 20 17 5.7 | 1.3 |
| 13 | 6 6 45.22 | .09 | 23 8 11.7 | 1.3 | 12 | 16 3 3.15 | -0.08 | -20 52 18.4 | -1.3 |
| 15 | 6 17 20.84 | .10 | 23 10 17.5 | 1.4 | 14 | 16 13 31.85 | .07 | 21 25 9.8 | 1.4 |
| 17 | 6 27 57.08 | .09 | 23 9 41.8 | 1.5 | 16 | 16 24 5.08 | .06 | 21 55 34.4 | 1.4 |
| 19 | 6 38 33.53 | .08 | 23 6 24.0 | 1.5 | 18 | 16 34 42 63 | .07 | 22 23 27.2 | 1.4 |
| 21 | 6 49 9.78 | -0.09 | +23 0 24.0 | +1.4 | 20 | 16 45 24.25 | .07 | 22 48 43.3 | 1.4 |
| 23 | 6 59 45.41 | .08 | 22 51 42.2 | 1.5 | 22 | 16 56 9.65 | -0.06 | -23 11 18.1 | -1.4 |
| 25 | 7 10 20.01 | .06 | 22 40 19.3 | 1.6 | 24 | 17 6 58.46 | .07 | 23 31 7.4 | 1.4 |
| 27 | 7 20 53.17 | .07 | 22 26 16.5 | 1.6 | 26 | 17 17 50.28 | .07 | 23 48 7.5 | 1.4 |
| 29 | 7 31 24.51 | .06 | 22 9 35 4 | 1.6 | 28 | 17 28 44.66 | .06 | 24 2 15.0 | 1.3 |
| 31 | 7 41 53.64 | .05 | 21 50 18.2 | 1.6 | 30 | 17 39 41.13 | .07 | 24 13 27.0 | 1.4 |
| Aug. 2 | 7 52 20.20 | -0.05 | +21 28 27.6 | +1.6 | Dec. 2 | 17 50 39.17 | -0.07 | -24 21 41.2 | -1.3 |
| 4 | 8 2 43.86 | .05 | 21 4 6.6 | 1.5 | 4 | 18 1 38.22 | .08 | 24 26 56.1 | 1.3 |
| 6 | 8 13 4.34 | .04 | 20 37 18.7 | 1.3 | 6 | 18 12 37.76 | .07 | 24 29 10.5 | 1.2 |
| 8 | 8 23 21.40 | .03 | 20 8 7.6 | 1.4 | 8 | 18 23 37.28 | .07 | 24 28 23.8 | 1.3 |
| 10 | 8 33 34.82 | .03 | 19 36 37.2 | 1.4 | 10 | 18 34 36.23 | .08 | 24 24 36.1 | 1.3 |
| 12 | 8 43 44.43 | -0.02 | +19 2 51.8 | +1.4 | 12 | 18 45 34.05 | -0.06 | -24 17 48.0 | -1.3 |
| 14 | 8 53 50.11 | .01 | 18 26 56.0 | 1.4 | 14 | 18 56 30.20 | .06 | 24 8 0.6 | 1.3 |
| 16 | 9 3 51.79 | .02 | 17 48 54.3 | 1.4 | 16 | 19 7 24.22 | .07 | 23 55 15.5 | 1.2 |
| 18 | 9 13 49.43 | .02 | 17 8 51.6 | 1.5 | 18 | 19 18 15.64 | .07 | 23 39 35.0 | 1.2 |
| 20 | 9 23 43.01 | .01 | 16 26 52.8 | 1.3 | 20 | 19 29 4.02 | .07 | 23 21 1.7 | 1.2 |
| 22 | 9 33 32.55 | -0.01 | +15 43 3.2 | +1.2 | 22 | 19 39 48.95 | -0.07 | -22 59 38.6 | -1.2 |
| 24 | 9 43 18.09 | .01 | 14 57 28.1 | 1.2 | 24 | 19 50 30.02 | .07 | 22 35 29.4 | 1.1 |
| 26 | 9 52 59.72 | .01 | 14 10 12.9 | 1.1 | 26 | 20 1 6.87 | .07 | 22 8 38.2 | 1.0 |
| 28 | 10 2 37.54 | .01 | 13 21 23.0 | 1.1 | 28 | 20 11 39.18 | .07 | 21 39 9.4 | 1.0 |
| 30 | 10 12 11.63 | -0.01 | +12 31 4.2 | +1.0 | 30 | 20 22 6.65 | .07 | 21 7 7.9 | 0.9 |
| | | | | | 32 | 20 32 29.04 | -0.08 | -20 32 38.9 | -0.8 |